Regional Transportation Plan 2050

Madison Area

Charting Our Course



Madison Area T • P • B

Transportation Planning Board

A Metropolitan Planning Organization

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Regional Transportation Plan 2050

for the Madison Metropolitan Area

Adopted April 5, 2017 by the

Madison Area Transportation Planning Board

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Madison, WI 53703

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The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation or WisDOT.

Resolution TPB No. 126

Adopting the Regional Transportation Plan 2050 for the Madison Metropolitan Area

WHEREAS, the Madison Area Transportation Planning Board (MATPB) is the designated Metropolitan Planning Organization (MPO) for the Madison, Wisconsin Metropolitan Area with responsibilities to perform regional transportation planning and programming, in cooperation with the Wisconsin Department of Transportation and Metro Transit, the major transit operator; and

WHEREAS, one of the primary responsibilities of the MATPB is to prepare and approve a long-range regional transportation plan in accordance with the Fixing America's Surface Transportation (FAST) Act (23 U.S.C. 104, 134) and implementing U.S. Department of Transportation (DOT) regulations (23 C.F.R. 450); and

WHEREAS, the regional transportation plan is a multi-modal transportation systems plan that defines the goals for the region and specifies the policies, projects, and strategies to help achieve these goals, and also ties the goals to performance measures to be used to track the region's progress in meeting plan goals over time; and

WHEREAS, the MATPB has updated the current adopted plan, the *2035 Regional Transportation Plan Update,* and extended the planning horizon from the year 2035 to 2050 using new population, household, and employment forecasts and revised travel demand forecasts to the year 2050; and

WHEREAS, the MATPB has followed the prescribed federal guidance for development of regional transportation plans as set out in the Metropolitan Transportation Planning rule, 23 C.F.R. 450 in the preparation of the plan, including consideration of the federal planning factors, identification of performance measures, and preparation of financial, environmental, and environmental justice analyses of the plan; and

WHEREAS, the MATPB's public involvement process for the plan included use of an interactive plan website where materials, including the draft plan, and notices of meetings were posted, oversight by a plan advisory committee to guide the planning process, a regional values and priorities survey, three series of public meetings throughout the process, other presentations and updates, and a March 1 public hearing on the draft plan, and comments have been considered throughout the process and changes made to draft materials and the draft plan as determined to be appropriate; and

WHEREAS, the regional transportation plan is intended to guide implementing agencies in development of projects and implementation of other recommendations and supporting actions to guide improvements for all modes of transportation until the next major update of the plan in five years; and

WHEREAS, in the meantime the MATPB commits to working with WisDOT and Metro Transit to identify the performance targets for the federal required transportation system performance measures as these measures are finalized, implement other requirements of the new

performance-based approach to planning, and annually prepare a performance measures report indicating progress achieved in reaching the selected targets for the federal measures as well as progress on the other measures selected by the MATPB to gauge success in achieving the goals of the regional transportation plan:

NOW THEREFORE BE IT RESOLVED, the MATPB adopts the *Regional Transportation Plan (RTP) 2050 for the Madison Metropolitan Area*, which incorporates the changes to the Draft RTP 2050, dated February 2017, listed in the Addition/Change sheet dated April 5, 2017, as the official transportation plan for the region to serve as a guide for transportation planning, system development, and investments and as the basis for the MATPB's review of proposed projects in the Transportation Improvement Program; and that this plan supersedes the *2035 Regional Transportation Plan Update*.

BE IT FURTHER RESOLVED that the MATPB certifies that the federal metropolitan transportation planning process is addressing major issues facing the metropolitan area and is being conducted in accordance with all applicable federal requirements, including:

1. 23 U.S.C. 134 and 49 U.S.C. 5303, and this subpart;
2. Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d-1) and 49 C.F.R. Part 21;
3. 49 U.S.C. 5332, prohibiting discrimination on the basis of race, color, creed, national origin, sex, or age in employment or business opportunity;
4. Sections 1101(b) of the Fixing America's Surface Transportation (FAST) Act (Pub. L. 114-357) and 49 C.F.R. Part 26 regarding the involvement of disadvantaged business enterprises in U.S. DOT funded projects;
5. 23 C.F.R. Part 230, regarding the implementation of an equal employment opportunity program on Federal and Federal-aid highway construction contracts;
6. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) and 49 C.F.R. Parts 27, 37, and 38;
7. The Older Americans Act, as amended (42 U.S.C. 6101), prohibiting discrimination on the basis of age in programs or activities receiving Federal financial assistance;
8. 23 U.S.C. 324 regarding the prohibition of discrimination based on gender; and
9. Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794) and 49 C.F.R. 27 regarding discrimination against individuals with disabilities.

04/05/2017
Date Adopted

Al Matano, Chair
Madison Area Transportation Planning Board

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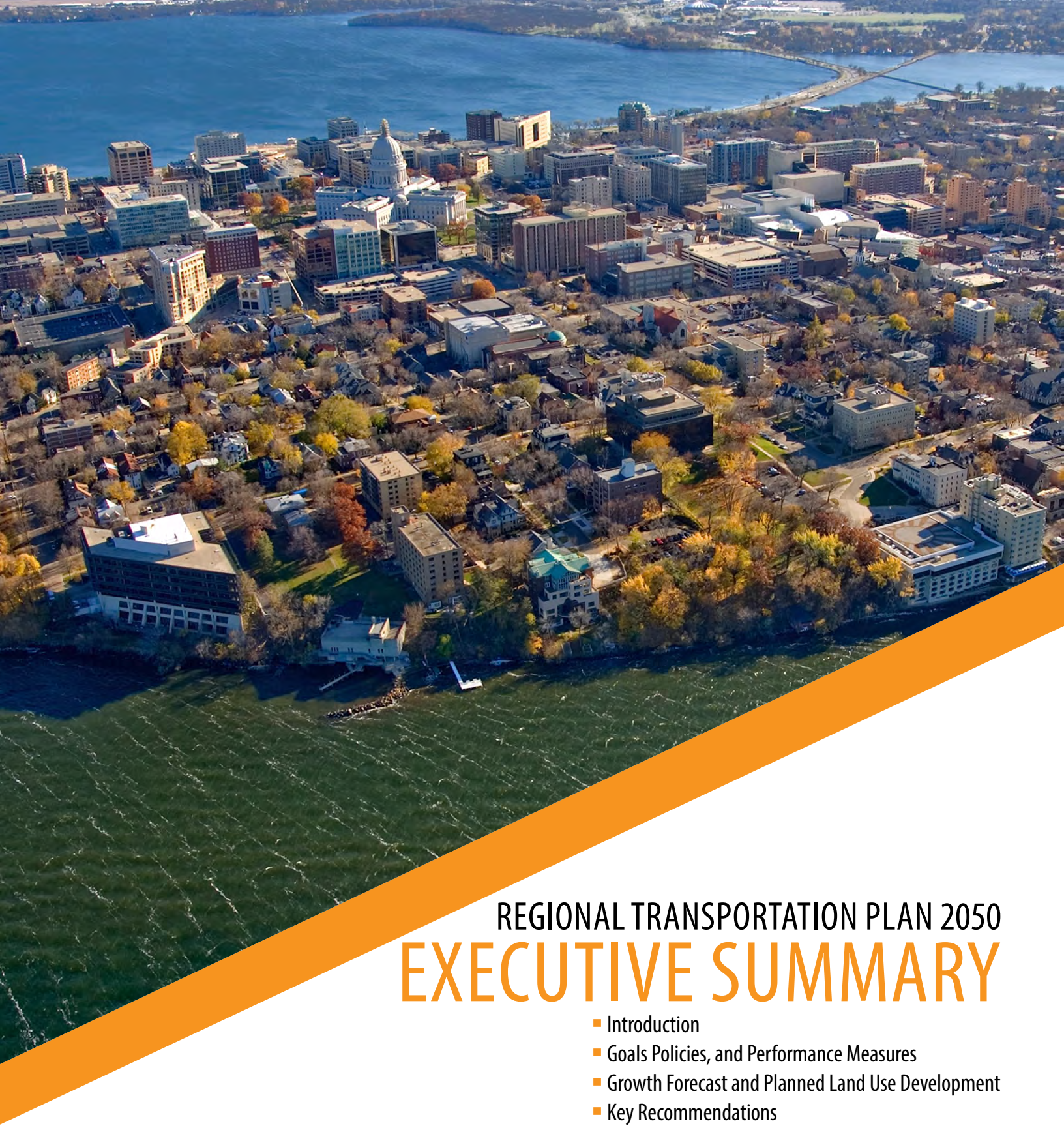
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List of Acronyms

ACS	American Community Survey
ADA	Americans with Disabilities Act (1990)
ADAD	Advanced Driver Assistance Systems
ADT	Average Daily Traffic
AWT	Average Weekday Traffic
BIC	Beltline-Interstate Interchange
BLS	Bureau of Labor Statistics
BR	Bridge Replacement Rehabilitation Program
BRT	Bus Rapid Transit
CAC	Citizen Advisory Committee
CARPC	Capital Area Regional Planning Commission
CBD	Central Business District
CMP	Congestion Management Process
CO2	Carbon Dioxide
CP	Canadian Pacific Railroad
CRSC	Capital Region Sustainable Communities Consortium
CRFC	Critical Rural Freight Corridor
CSS	Context Sensitive Solutions
CTH	County Trunk Highway
CUFS	Critical Urban Freight Corridor
DCDHS	Dane County Department of Human Services
DCRA	Dane County Regional Airport
DCRTA	Dane County Regional Transit Authority
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	Environmental Protection Agency
FAST Act	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FUDA	Future Urban Development Area
FY	Fiscal Year
GIS	Geographic Information System
GPS	Global Positioning System
GTA	General Transportation Aids
HSIP	Highway Safety Improvement Program
HSMO	Highway System Management and Operations Program
HUD	U.S. Department of Housing and Urban Development
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITS	Intelligent Transportation Systems
LED	Light Emitting Diode
LEED	Leadership in Energy and Environmental Design
LEHD	Longitudinal Employer-Household Dynamics (Survey)
LOS	Level of Service
LRIP	Local Roads Improvement Program
MAP-21	Moving Ahead for Progress in the 21st Century Act
MATC	Madison Area Technical College/Madison College
MATPB	Madison Area Transportation Planning Board
MPO	Metropolitan Planning Organization
MUTCD	Manual on Uniform Traffic Control Devices
NBI	National Bridge Inventory
NEPA	National Environmental Policy Act
NHFN	National Highway Freight Network
NHFP	National Highway Freight Program
NHPP	National Highway Performance Program
NHS	National Highway System Program
NHTS	National Household Transportation Survey
NHTSA	National Highway Traffic Safety Administration
NMFN	National Multimodal Freight Network
NTD	National Transit Database
O/D	Origin - Destination
O & M	Roadway Operations and Maintenance Costs
QCEW	Quarterly Census of Employment and Wages
PASER	Pavement Surface Evaluation and Rating
PCI	Pavement Condition Index
PDI	Pavement Distress Index
PEL	Planning and Environmental Linkages
PHFS	Primary Highway Freight System
PM 2.5	Fine particulate matter suspended in air
PNR	Park-and-Ride
ROW	Right of Way
RSVP	Retired Senior Volunteer Driver Escort Program
RTA	Regional Transit or Transportation Authority
RTP	Regional Transportation Plan
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SASY	Schenk-Atwood-Starkweather-Yahara Neighborhood
SHR	State Highway Rehabilitation
SHSP	Strategic Highway Safety Plan
SOV	Single Occupant Vehicle
SRTS	Safe Routes to School
STBG	Surface Transportation Program Block Grant
STH	State Trunk Highway
STOC	State Traffic Operations Center
STP	Surface Transportation Program
TAP	Transportation Alternatives Program
TAZ	Traffic Analysis Zone
TCC	Technical Coordinating Committee
TDM	Travel Demand Management
TDP	Transit Development Plan
TID	Tax Increment District
TIGER	Transportation Investment Generating Economic Recovery (Grant Program)
TIP	Transportation Improvement Program
TMA	Transportation Management Area
TOD	Transit-Oriented Development
TOIP	Transportation Operations Infrastructure Plan
TOPS	(UW-Madison) Traffic Operations and Safety (Laboratory)
TPC	Transportation Projects Commission
TSM	Transportation Systems Management
UAFP	Urbanized Area Formula Program
UAS	Unmanned Aircraft System
UAV	Unmanned Aerial Vehicle
UP	Union Pacific Railroad
UPWP	Unified Planning Work Program
USA	Urban Service Area
USDOT	United States Department of Transportation
USH	U.S. Highway
UW	University of Wisconsin
V/C	Volume-to-Capacity Ratio
VMT	Vehicle Miles Traveled
V2I	Vehicle to Infrastructure Communication
V2V	Vehicle to Vehicle Communication
WisDNR	Wisconsin Department of Natural Resources
WisDOA	Wisconsin Department of Administration
WisDOT	Wisconsin Department of Transportation
WISLR	Wisconsin Information System for Local Roads
WRRTC	Wisconsin River Rail Transit Commission
WSOR	Wisconsin & Southern Railroad Company
3C	Continuing, Comprehensive, and Cooperative Transportation Planning Process
3-E	Engineering, Education, and Enforcement

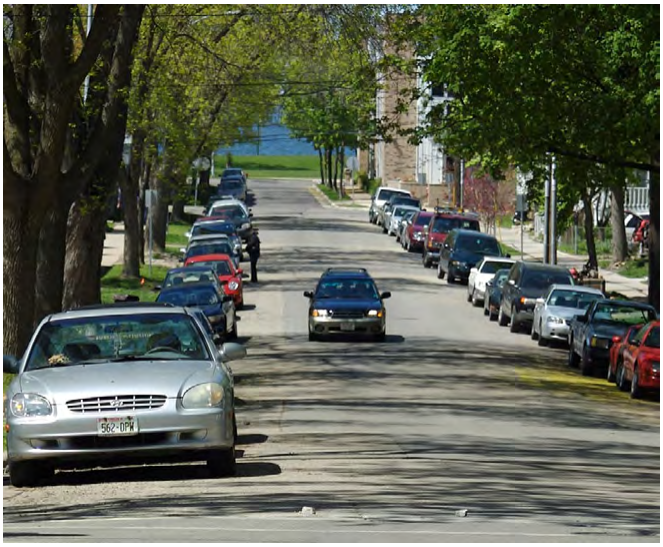


REGIONAL TRANSPORTATION PLAN 2050
EXECUTIVE SUMMARY

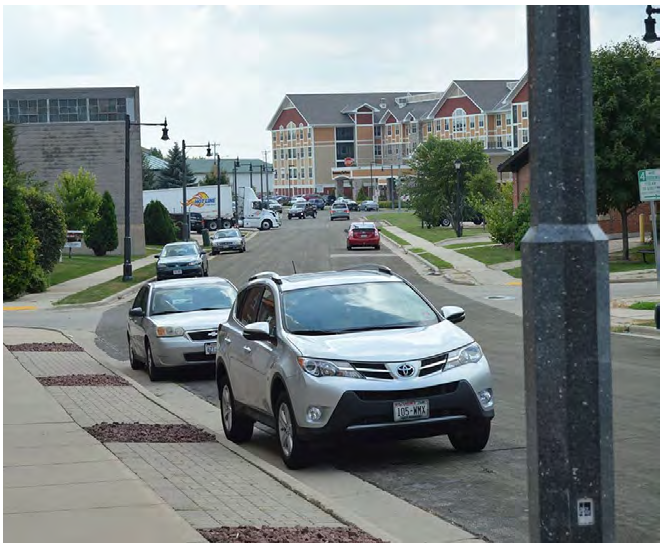
- Introduction
- Goals Policies, and Performance Measures
- Growth Forecast and Planned Land Use Development
- Key Recommendations

INTRODUCTION

Dane County's population and economy are growing and changing. The population is becoming more diverse and the economy is becoming more private sector oriented with job growth at the higher and lower ends of the economic spectrum. While the City of Madison continues to garner a large share of this growth, its share of population and employment has declined and is expected to continue to do so. Within the city, however, a higher percentage of new housing and employment is locating in redevelopment areas, most notably East Washington Avenue. A safe, efficient, integrated multimodal regional transportation system is needed to support this growth.



The Greater Madison Region Values and Priorities survey, conducted in early 2016, identified the key factors that make the region attractive to residents, regional values, and perceived needs for the future. Results of the survey demonstrated that regional growth is due to many factors – an excellent educational system, a robust economy, local agriculture, a strong sense of community, and access to nature and outdoor recreation – which have led to a high quality of life and positive regional outlook. Six out of ten survey participants believed that "lots more growth will be coming to this region whether we want it or not – the best thing we can do is prepare for it." At the same time, seven out of ten of participants believed regional growth "has and will continue to bring many benefits and advantages to the region . . . and should be strongly encouraged and fostered." Perhaps unsurprisingly, 67% of participants believed that it was very or extremely important to have a long range plan for growth while 81% agreed that "investing in regional transportation is an important priority for the region."



The Regional Transportation Plan (RTP) 2050 is the Madison region's blueprint for its future multimodal transportation system. The plan builds upon previous RTPs, with updated analysis, growth forecasts, goals, and policies. The plan also builds upon recent and ongoing MPO, WisDOT, and local plans and studies such as the MPO's Madison Transit Corridor – Investigating Bus Rapid Transit Study and the Bicycle Transportation Plan for the Madison Metropolitan Area. Finally, the plan includes some updates to meet new federal requirements, most notably related to performance management. Planning is a continuing process, and the RTP will be updated again in five years.



GOALS, POLICIES, AND PERFORMANCE MEASURES

The goals and policies in the RTP build upon those identified in previous planning efforts, refined through outreach with the public and key stakeholders. Throughout the goals and policies, the principles of sustainability are prominently featured:

- Social Equity: The transportation system should be designed to provide an equitable level of services to all segments of the population across all modes.
- Environment: The transportation system should be designed and operated within the context of its environment, minimizing negative impacts and fostering efficient development patterns that optimize travel, housing, and employment choices. The system should support existing and planned development and discourage growth in rural areas.
- Economy: The transportation system should ensure that businesses have maximum opportunities to serve customers, reach clients, export goods, and obtain workers. The system should play a significant role in raising the region's standard of living and quality of life.



The goals featured in the plan began as a set of aspirational statements about desired outcomes that the region would work towards achieving. These were refined into a set of goals to guide the plan's policy and project recommendations:

1. Create Connected Livable Neighborhoods and Communities: Create interconnected livable places linked to jobs, services, schools, shops, and parks through a multi-modal transportation system that is integrated with the built environment and supports compact development patterns that increase the viability of walking, bicycling, and public transit.
2. Improve Public Health, Safety, and Security: Design, build, operate, and maintain a transportation system that enables people to get where they need to go safely and that, combined with supportive land use patterns and site design, facilitates and encourages active lifestyles while improving air quality.
3. Support Personal Prosperity and Enhance the Regional Economy: Build, operate, and maintain a transportation system that provides people with affordable access to jobs and enables the exchange of goods and services within the region and to/from other regions.
4. Improve Equity for Users of the Transportation System: Provide an equitable level of transportation facilities and services for all regardless of age, ability, race, ethnicity, or income.
5. Reduce the Environmental Impact of the Transportation System: Ensure that the transportation system is designed, built, operated, and maintained in a way that protects and preserves the natural environment and historic and cultural resources, and is supportive of energy conservation.
6. Advance System-wide Efficiency, Reliability, and Integration Across Modes: Design, build, operate, and maintain an efficient transportation system with supportive land use patterns that maximize mobility, minimizes unexpected delays, and provides seamless transfers between all modes.
7. Establish Financial Viability of the Transportation System: Achieve and maintain a state of good repair for the existing transportation system, invest in cost-effective projects, and ensure adequate, reliable funding to meet current and future needs.

Each goal is supported by a number of policies that provide a structure for regional project prioritization and transportation decision-making. The goals and policies are tied to a number of performance measures, including some federally required measures that correspond to national transportation system performance goals as well. The purposes of this performance based approach are to ensure that investment decisions are made based on objective information and to improve communications between decision-makers, stakeholders, and the public while achieving regional, state, and national performance goals.

GROWTH FORECASTS & PLANNED LAND USE DEVELOPMENT

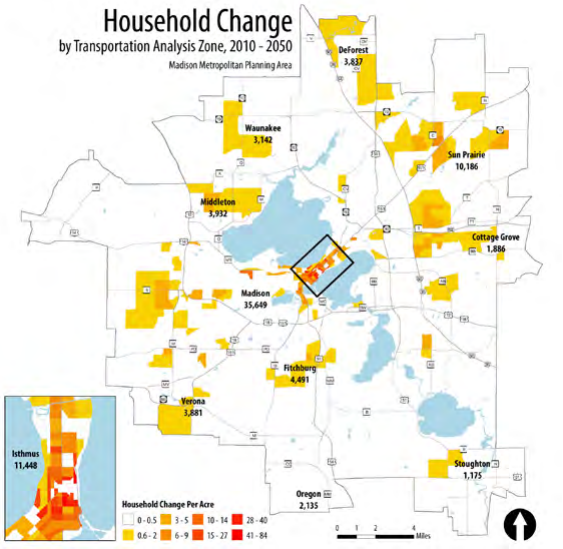
The Madison region has been growing steadily for several decades. The population, household, and employment forecasts used for development of the RTP were prepared by the Capital Area Regional Planning Commission and reflect recent trends. This includes the trend of many suburban communities' population growing at faster rates than the City of Madison and also increased commuting by workers into Dane County from adjacent counties.

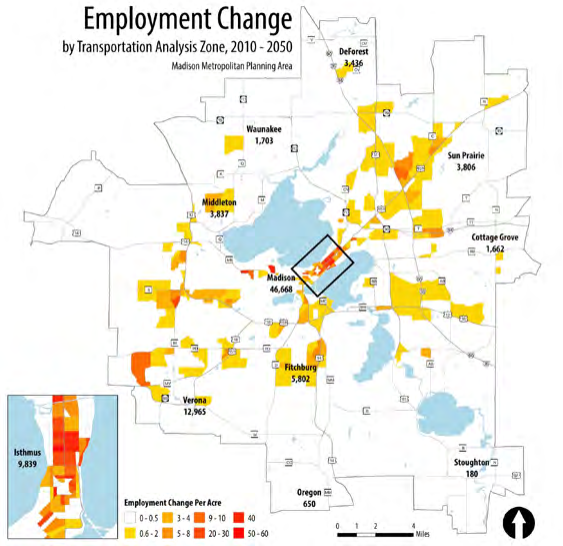
Between 2010 and 2050, the City of Madison's population is projected to increase by 57,900, or 25%, while the regional population will increase by 149,350, or 31%, for a total future population of 637,450 within the metropolitan planning area. During this time, the average size of household in the region is expected to continue to decline, while the aged population increases, and the region becomes increasingly diverse.

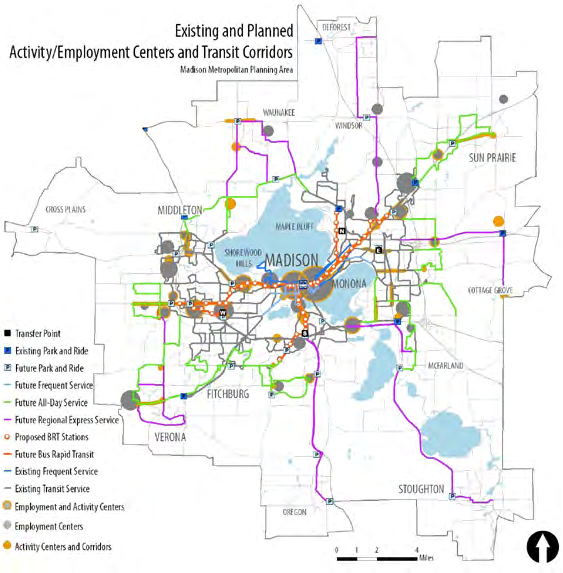
Dane County's employment is forecast to increase from 314,000 to 398,700, while the 2050 resident employed labor force is projected to be 316,300. Assuming the percentage of Dane County workers working in other counties remains at 5.3%, the number of workers commuting into the county from other counties would increase to 99,100, a 136% increase from today's numbers. This reinforces the need for regional transportation improvements, including an increase in options to driving alone. Roughly 53% of the new jobs are projected to be located in the City of Madison, with all but about 2,000 of the remainder in the rest of the metro area.

Travel demand is dependent upon the location, density, and mixture of land uses. The allocation of future growth was based on the regional land use policy plan and local comprehensive plans. It reflects both regional and City of Madison policy to encourage development in higher density, mixed-use centers and corridors with existing and planned high capacity and frequent transit service.

Within the City of Madison, over one-half of new housing units were allocated to infill/redevelopment areas as opposed to peripheral "greenfield" areas, reflecting recent trends, with 11,500 new units located in the Isthmus area along with almost 10,000 new jobs. This compact, centers and corridors based land use development pattern was used to develop future travel forecasts. The map to the right shows how the recommended transit system could serve and connect existing and planned mixed-use activity centers and corridors and employment centers.







KEY RECOMMENDATIONS

Recommendations include a mixture of policies, strategies, studies, and projects. Key recommendations include:

Land Use and Transportation Integration

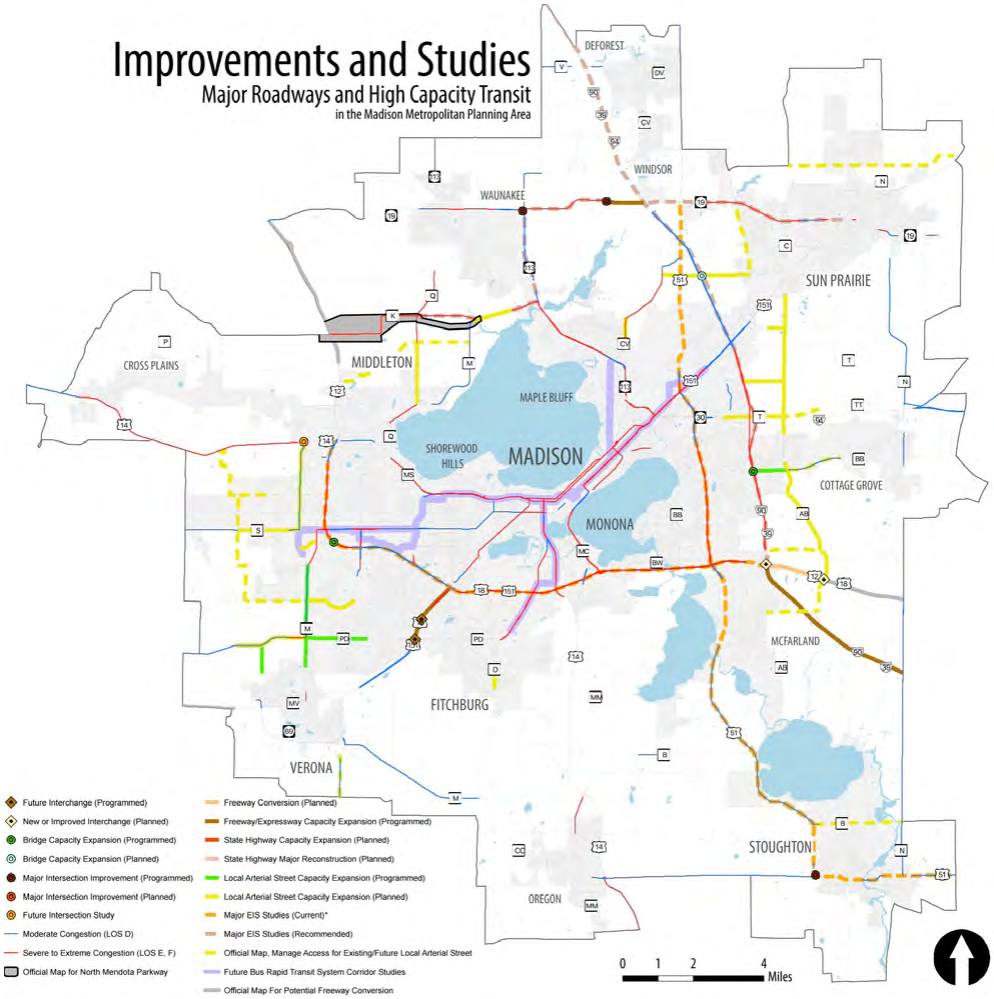
- Adopt local land use plans and policies that support land use related RTP goals and policies.
- Develop urban areas with a mix of housing types and land uses to provide walkable, affordable neighborhoods.

Streets and Roadways

- Preserve and maintain the region's street and highway system.
- Build a well-connected network of regional roadways to accommodate future growth and efficiently distribute traffic.
- Incorporate complete streets and green streets concepts for regional and local roadways.
- Expand regional roadway system capacity to address critical bottlenecks and accommodate future planned growth consistent with RTP goals and policies.
- Address safety needs on the regional roadway system through a comprehensive "3-E" approach.

Public Transit

- Implement a BRT system.
- Improve the local bus network.
- Add all-day service in developing neighborhoods.
- Enhance transit stops.
- Utilize alternative service delivery models to serve low-demand areas.
- Implement a regional express bus network.
- Expand park-and-ride facilities in conjunction with BRT and express services.
- Implement a regional transit entity with stable funding and representative governance.



Bicycles

- Expand the bikeway network with new shared-use paths and on-street facilities.
- Maintain and modernize existing bicycle facilities.
- Eliminate bicycle barriers and hazards in the bikeway network.
- Provide adequate bicycle parking.
- Improve bicyclist safety through a "3-E" approach.
- Continue bike share, education, and bicycle supportive policies.

Pedestrians

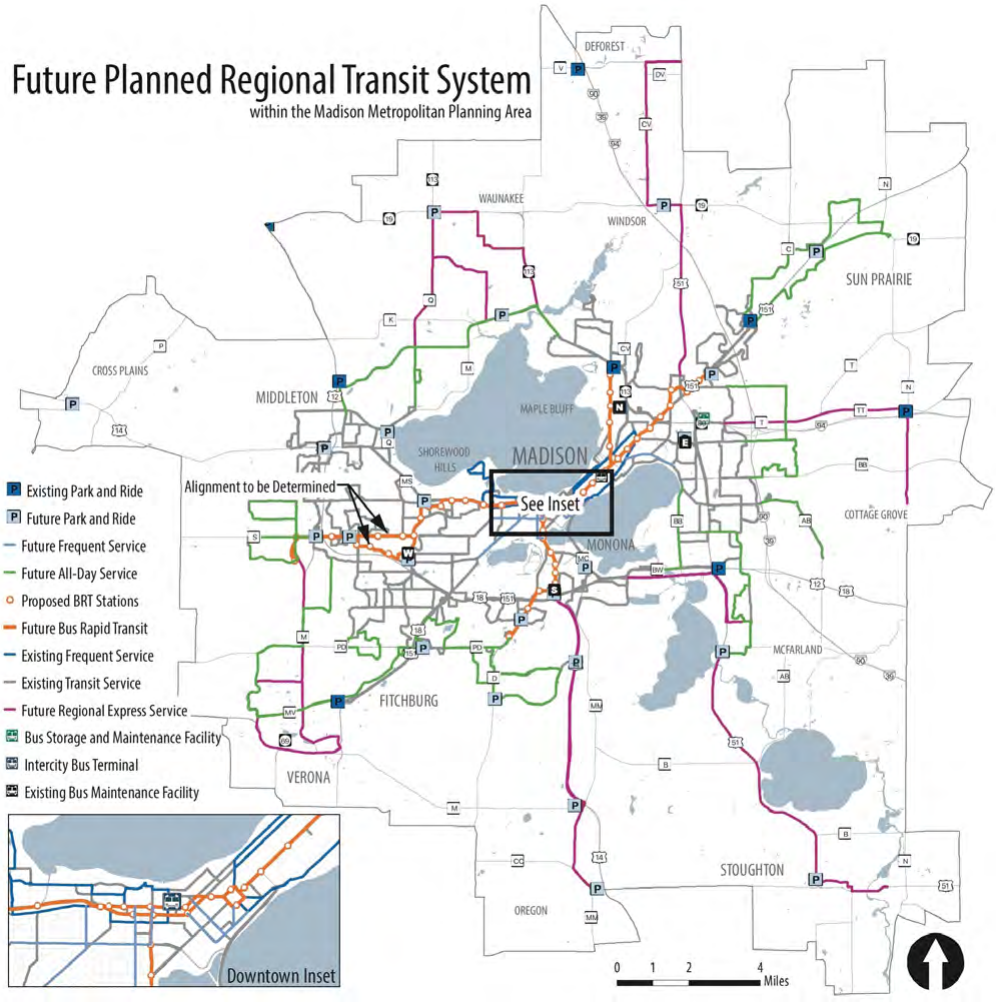
- Provide sidewalks and appropriate pedestrian amenities in developing neighborhoods.
- Retrofit regional streets with modern, safe pedestrian accommodations.
- Improve safety and usability for pedestrians at intersections and crossings.
- Maintain sidewalks and pedestrian facilities for year-round use.
- Design new streets and retrofit existing streets to reduce speeding.

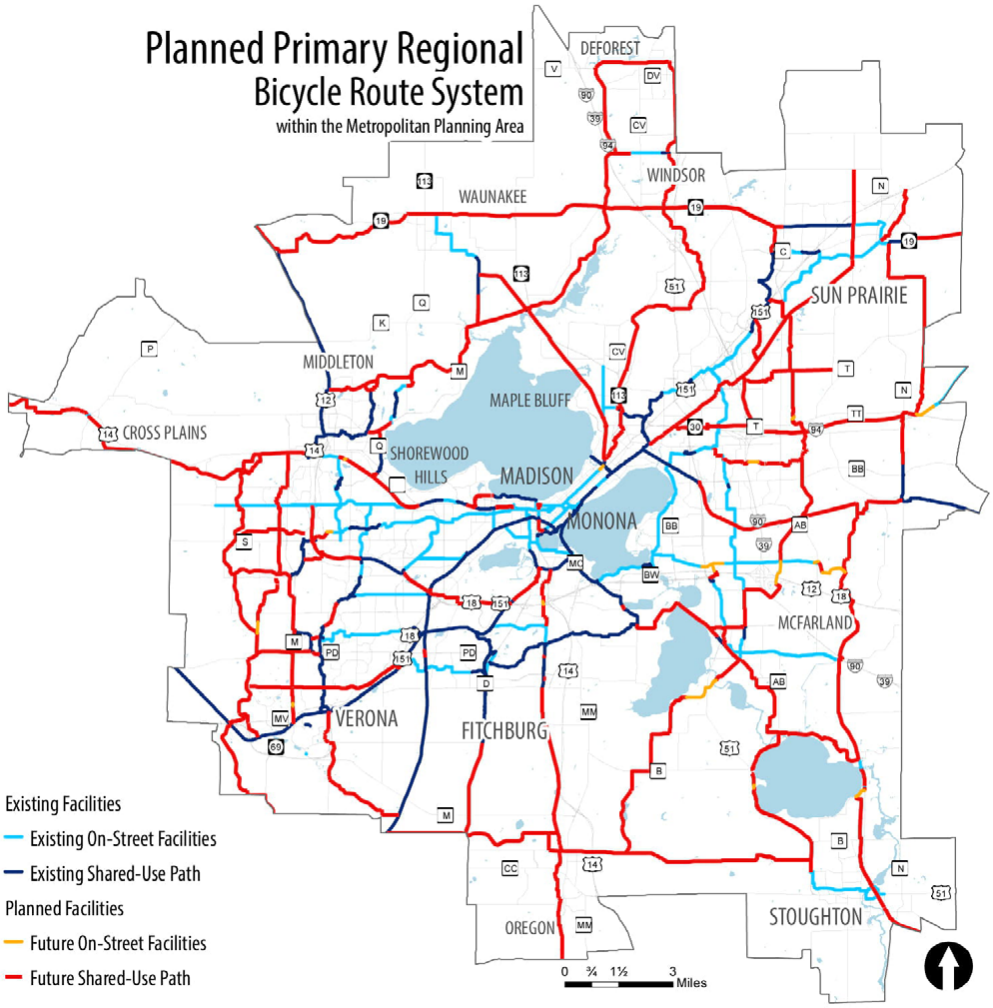
Inter-regional Travel

- Initiate planning for and build an inter-city bus terminal.
- Support new and improved inter-city bus service.
- Maintain and preserve the rail network for future passenger rail service.

Specialized Transit

- Expand the coverage of accessible fixed-route bus and paratransit service.
- Work collaboratively with private taxi operators to ensure accessible taxi service is available and costs for the service are shared equitably.
- Continue and expand specialized work-based transportation for low-income people.
- Utilize emerging technologies to lower operating costs and expand travel options.
- Improve interagency coordination of the various specialized transit services and private services.





Travel Demand Management (TDM)

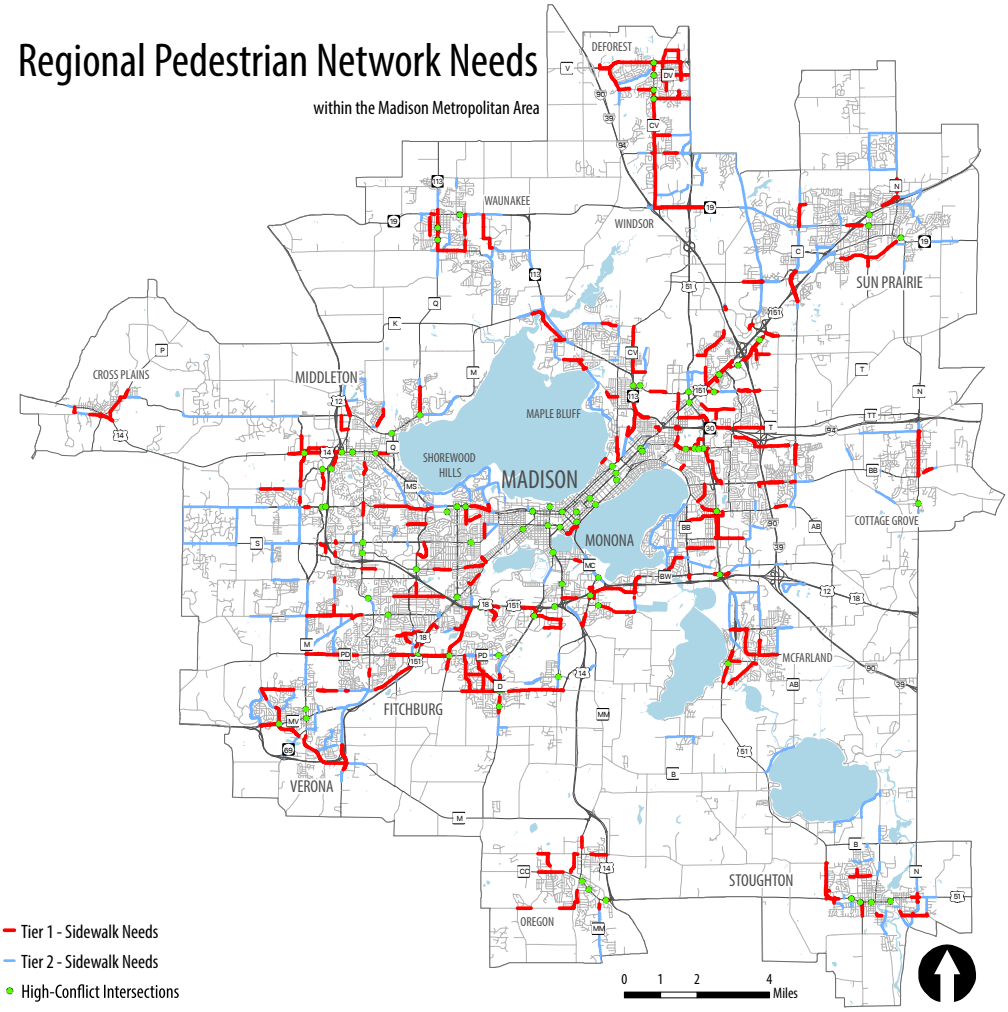
- Expand the regional network of park-and-ride lots to encourage carpooling, transit use, and bicycling.
- Expand the state vanpool program and support the development of additional vanpool programs.
- Continue to encourage and provide support to large employers, institutions, and municipalities to develop and promote strategies to reduce single-occupant motor vehicle trips.
- Provide financial incentives for people to use alternative transportation and increase funding for marketing programs.
- Support transportation options at schools through Safe Routes to School programs.

Transportation System Management (TSM), Operations, and Intelligent Transportation Systems (ITS)

- Expand the regional network of park-and-ride lots to encourage carpooling, transit use, and bicycling.
- Expand the state vanpool program and support the development of additional vanpool programs.
- Continue to encourage and provide support to large employers, institutions, and municipalities to develop and promote strategies to reduce single occupant motor vehicle trips.
- Provide financial incentives for people to use alternative transportation and increase funding for marketing programs.
- Support transportation options at schools through Safe Routes to School programs.

Freight, Air, and Rail

- Maintain and promote new industrial uses along freight corridors.
- Maintain and expand existing infrastructure on the multimodal freight network, prioritizing projects that improve safety, increase efficiency, and minimize lifetime costs.
- Increase focus on freight planning for regional and local transportation facilities.
- Maintain the availability of rail facilities for current and future uses.
- Mitigate conflicts between rail and other uses.
- Ensure the compatibility of uses near airports.



- Improve airport facilities to enhance usability and convenience for passenger traffic.
- Improve the airport's freight accommodations and connections.

Parking

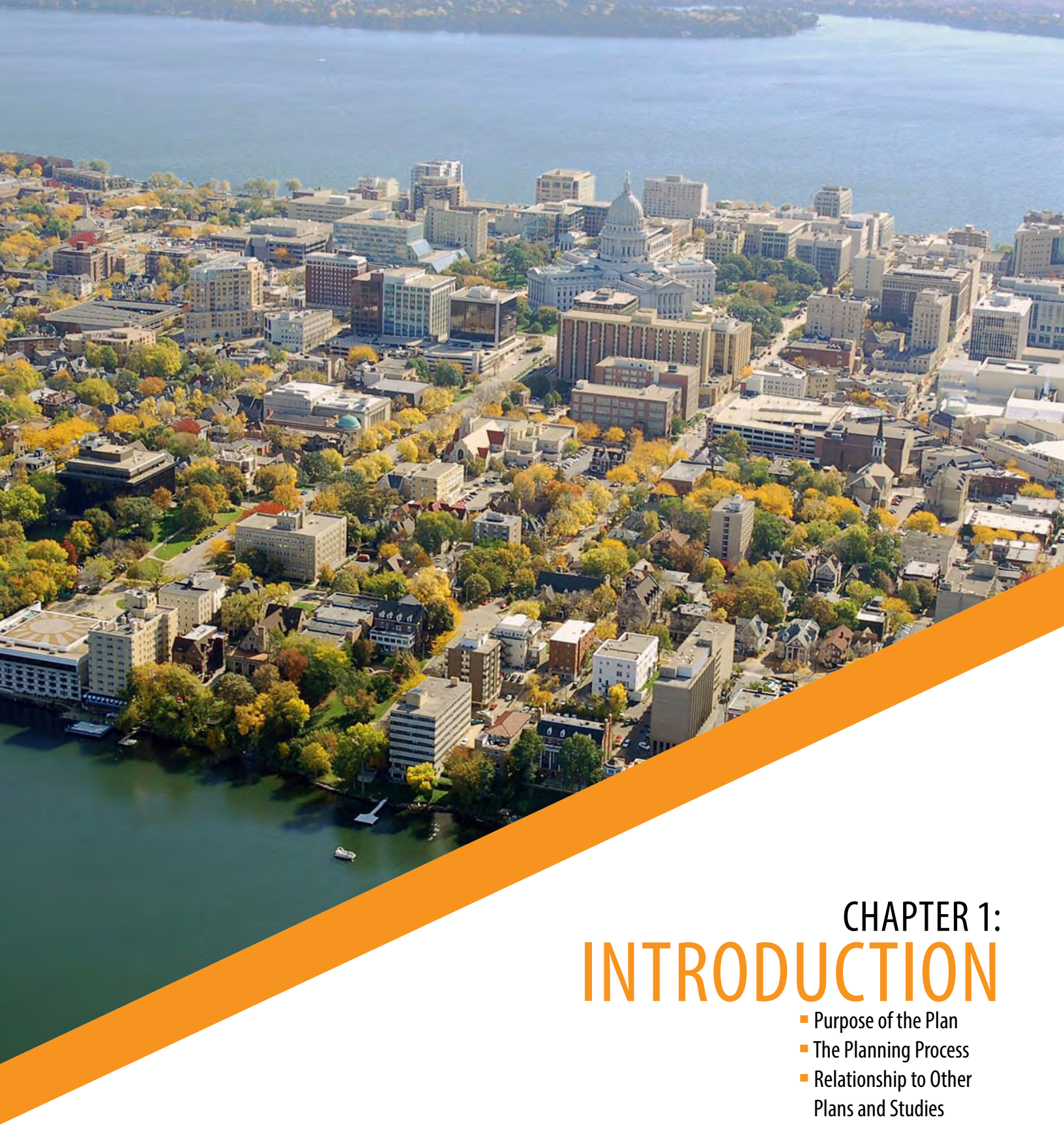
- Use parking management strategies to reduce congestion within downtown areas and major activity centers.
- Modify parking requirements to encourage multi-modalism and innovative design using a more market-based approach.
- Ensure flexibility of parking facilities to accommodate future technologies.

For more information contact:

Madison Area T • P • B
Transportation Planning Board
A Metropolitan Planning Organization

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The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation or WisDOT.



CHAPTER 1: INTRODUCTION

- Purpose of the Plan
- The Planning Process
- Relationship to Other Plans and Studies
- Stakeholder Involvement and Public Outreach

PURPOSE OF THE PLAN

The Madison Region is Growing

Since 2000, over 22% of the state of Wisconsin's population growth occurred within Dane County. A highly urban county, nearly 90% of the county population lives in the Madison Urban Area. During the same time period, employment within the county grew by nearly 37,000. As the region grows and evolves, it will need an efficient, safe, and integrated transportation system. The system must provide a mix of transportation choices – walking, biking, transit, and driving – that provide a variety of ways to access jobs, recreational facilities, shops, restaurants, and other communities.

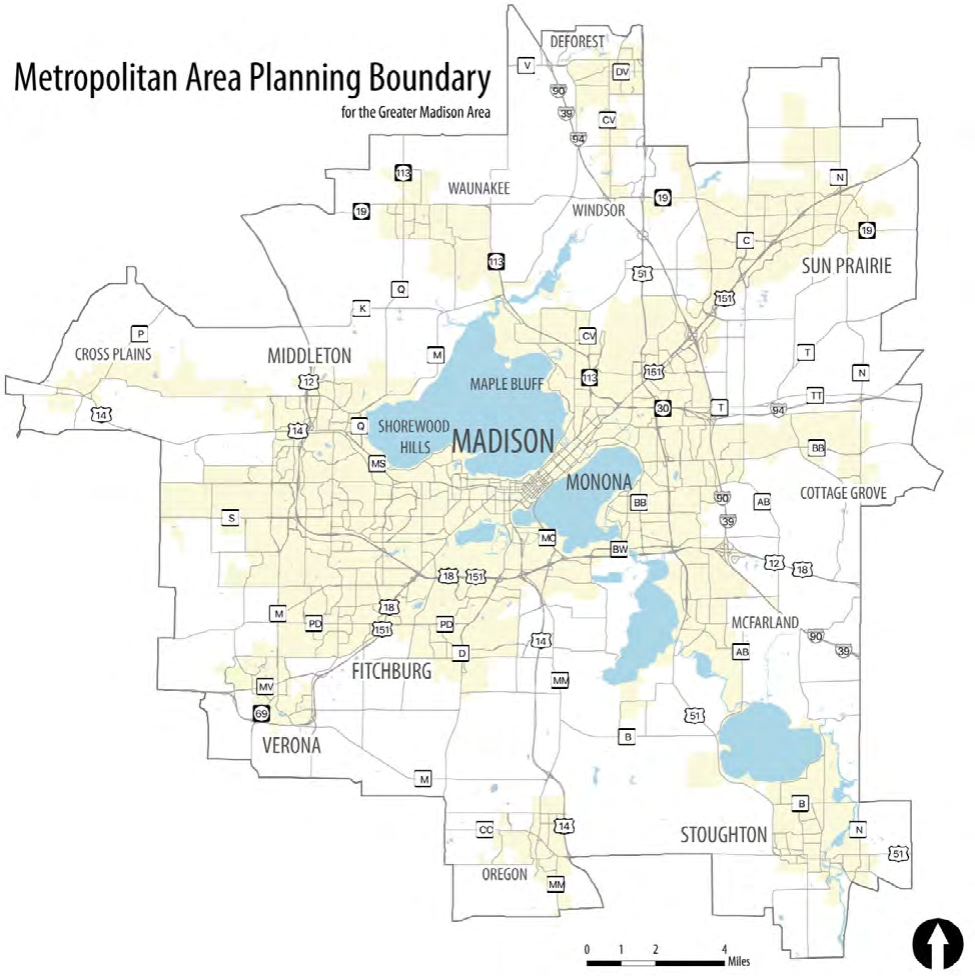


Figure 1-1: MATPB Planning Boundary

The purpose of this plan is to identify how the region will invest in the transportation system across all modes over the next 30+ years. The plan will ensure that transportation projects are coordinated between the various levels of government (municipal, county, and state.)

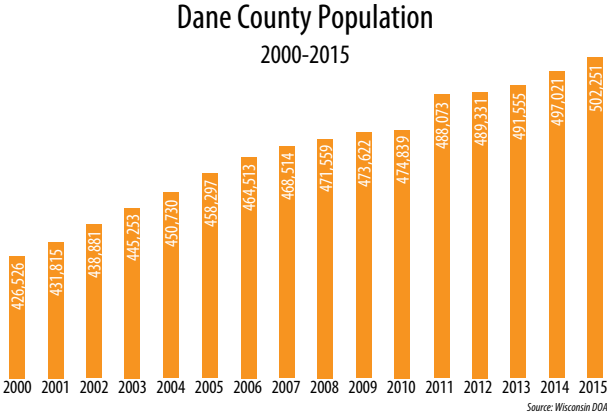


Figure 1-2: Dane County Population 2000 - 2015

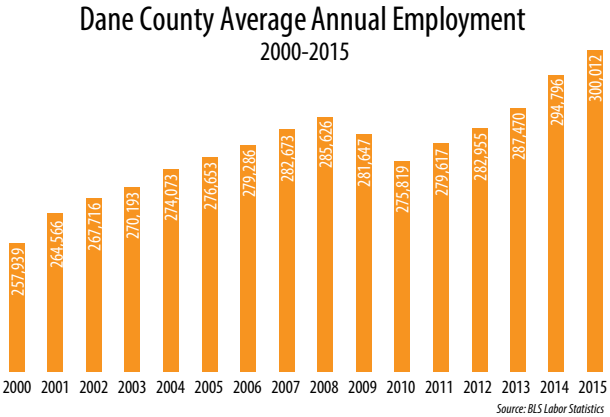


Figure 1-3: Dane County Average Annual Employment 2000 - 2015

Why is the Transportation System Important?



In late 2015, the Madison Area Transportation Board (MATPB), the Metropolitan Planning Organization (MPO) for the Madison area, teamed with the Capital Area Regional Planning Commission (CARPC) on the Greater Madison Region Values and Priories Survey. The purpose of the survey was to determine the values and priorities of area residents to ensure that planning decisions speak to and correspond with the desires of the region's residents.

Results of the survey show that financial well being – the ability to afford to live in the region – is the value driving most regional residents. To that end, the transportation system is critical to the economic success of residents and businesses in the region.

For businesses, a well-developed transportation network allows for the quick and efficient movement of services and goods. For example, "just-in-time" delivery has been used in the manufacturing industry as an inventory management strategy. The businesses increase their efficiency and reduce their overhead by receiving raw materials or production inputs just before they are needed in the production process. In the retail, restaurant, and hospitality industries,it is important to have a network that is reliable and convenient to ensure a steady stream of customers. For biotech and software businesses, convenient access to an airport for freight shipments and business flights could be the difference between locating in the region or not. A high quality transportation system with transit and bicycling options is also important for businesses in attracting young, educated, and skilled workers. National surveys have shown this is one of the top criteria of Millennials in choosing where to live.

For residents, an integrated multi-modal transportation system provides multiple options for commuting, shopping, leisure, and regional travel. Transportation also impacts neighborhood and community affordability, as well as the viability of community development. The transportation network also has a direct impact on the quality of life in the region. Safe and efficient regional transportation facilities ensure convenient business and leisure travel. An integrated, well-connected network makes traveling by all modes more convenient and enjoyable. The network can also help to foster community with streets acting as community, gathering and meeting spaces.

The Role of the Metropolitan Planning Organization

MPOs, such as MATPB, are statutorily required in all urbanized areas with a population of more than 50,000. As required by federal law, MPOs are policy boards comprised of mostly local elected officials that perform six core functions:

1. Establish a setting for effective transportation planning and decision-making that is a fair and impartial.
2. Identify and evaluate transportation improvement options, and use data and planning methods to determine whether the options support long-range regional goals and system performance targets.
3. Prepare and maintain a Regional Transportation Plan (RTP).
4. Develop and maintain a Transportation Improvement Program (TIP).
5. Identify performance measure targets and monitor whether implemented projects are achieving targets.
6. Involve the general public and other affected constituencies in the planning process.

During the RTP, TIP, and Unified Planning Work Program (UPWP)[1] development and maintenance processes, MPOs engage state departments of transportation, transit providers, and local municipalities in a continuing, comprehensive, and cooperative (3C) multimodal transportation planning process. This 3C process ensures that resources are used in the most effective manner

[1] https://www.transit.dot.gov/regulations-and-guidance/transportation-planning/unified-planning-work-program-upwp

possible and that there is continuity of the transportation system across jurisdictions.

MPOs do not own nor operate transportation systems, but rather serve to coordinate and build consensus in the planning and programming of funds for transportation projects and operations. MATPB involves a variety of stakeholders into the planning process including Metro Transit, WisDOT, the airport authority, rail-freight providers, private providers of transit, and local municipalities.

Urbanized areas with populations of more than 200,000, such as the Madison region, are designated as Transportation Management Areas (TMAs). TMAs have additional planning responsibilities, including the creation of a congestion management process. Further, TMAs must include officials of public agencies that administer or operate public transportation systems within the metropolitan area on the policy board as well as appropriate state officials.[2]

Federal Regional Transportation Planning Requirements

Most major transportation projects are funded through a mix of federal, state, and local funding. Likewise, projects can have a variety of lead agencies that are responsible for planning, construction, and maintenance, including communities, counties, and states. To ensure a unified metropolitan transportation planning process, FHWA's Metropolitan Planning Program provides funding for MPOs to act as a coordinating agency. MPOs work with all stakeholders involved on projects to ensure a seamless transportation network, logical timing of project construction, and to eliminate reduncancy between communities. Agreed upon projects are added to the TIP. Projects that are not in the TIP cannot receive federal transportation funding.

MPOs are bound by a number of statutory requirements that are incorporated into transportation funding and authorization bills. For example, in 2012, the Moving Ahead for Progress in the 21st Century Act (MAP-21) was authorized. MAP-21 largely built upon the previous authorization and added requirements to use a performance-based approach to transportation decision making and the development of transportation plans.[3] To meet this requirement, MPOs create performance reports that contain targets set to correspond with plan goals.

The most recent authorization bill, the Fixing America's Surface Transportation Act (FAST), builds upon MAP-21, and adds requirements that MPOs:

- Identify and list intercity bus providers, intercity bus routes, intercity bus facilities, and commuter van pool providers in regional transportation plans. Identify public transportation facilities and providers in regional transportation plans
- Add a representative of a transit provider to the MPO board with equal authority as other members and allow them to also represent their local community
- Consult with additional local planning officials during the planning process, including tourism and natural disaster preparedness planners
- Expand the scope of the regional transportation plan to add improving the transportation system resiliency and reliability; reducing or mitigating the storm water impacts of surface transportation, and enhancing travel and tourism
- Develop strategies to reduce the vulnerability of existing transportation infrastructure to natural disasters
- Consider the role that intercity buses may play in reducing congestion, pollution, and energy consumption in a cost-effective manner; and strategies and investments that preserve and enhance both public and privately owned and operated intercity bus systems
- Ensure that public ports and private providers of transportation, including intercity bus operators and employers with commuting programs be given reasonable opportunity to comment on the RTP

MATPB has worked to fulfill these and other requirements since the FAST Act was authorized.

[2] http://www.fhwa.dot.gov/planning/publications/briefing_book/part01.cfm
[3] http://www.fhwa.dot.gov/map21/factsheets/mp.cfm

A Performance-Based Approach



MAP-21 introduced a requirement for MPOs to take a performance-based approach to planning and programming. This performance-based approach will produce measurable outcomes that can influence future decisions. The FAST Act continues this transition towards a performance-based, outcome-driven approach.

The U.S. Department of Transportation (USDOT) recommends the following performance-based planning and programming process:

- Strategic Direction– a vision for the future, as articulated by the public and key stakeholders:
  - Goals– an aspiration or desired result of the plan
  - Objectives – Strategies or implementation steps to attain the identified goals
  - Performance Measures – Ways to quantitatively examine and track the progress towards implementing objectives over time
- Planning Analysis – a public involvement and performance-driven review of existing and projected future conditions used to develop investment and policy priorities:
  - Identification of Trends and Targets – review of the performance data to find the general direction of measures and setting of desired levels of performance to be achieved within a certain time frame
  - Identification of Strategies and Analysis of Alternatives – development of scenarios with packages of policies and/or projects that could be used to reach identified performance targets or explore the types of funding that would be required to achieve a certain level of performance
  - Development of Investment Priorities – selection of the scenario that supports attainment of the targets, considering trade-offs between different goal areas as well as policy priorities
- Programming – Selecting specific investments to include in the transportation improvement program or TIP:
  - Development of Investment Plan – an optional mid-range (10-year) plan that links the TIP to the RTP
  - Allocation of Resources / Programming Projects – TIP project prioritization based upon the basis of performance with a demonstrated clear link to meeting performance objectives
- Evaluation of Implementation – Ongoing review of success and failures:
  - Monitoring – gathering information on actual conditions
  - Evaluation – analysis to understand the extend implemented strategies have been effective
  - Reporting – communicating information about system performance and effectiveness of plans and programs to policymakers, stakeholders, and the public

MATPB completed the first Performance Measures Report for the Madison area in 2016. The results of the report informed the recommendations in the RTP and will also inform projects selected for inclusion in the TIP.

Performance-Based Planning and Programming Framework

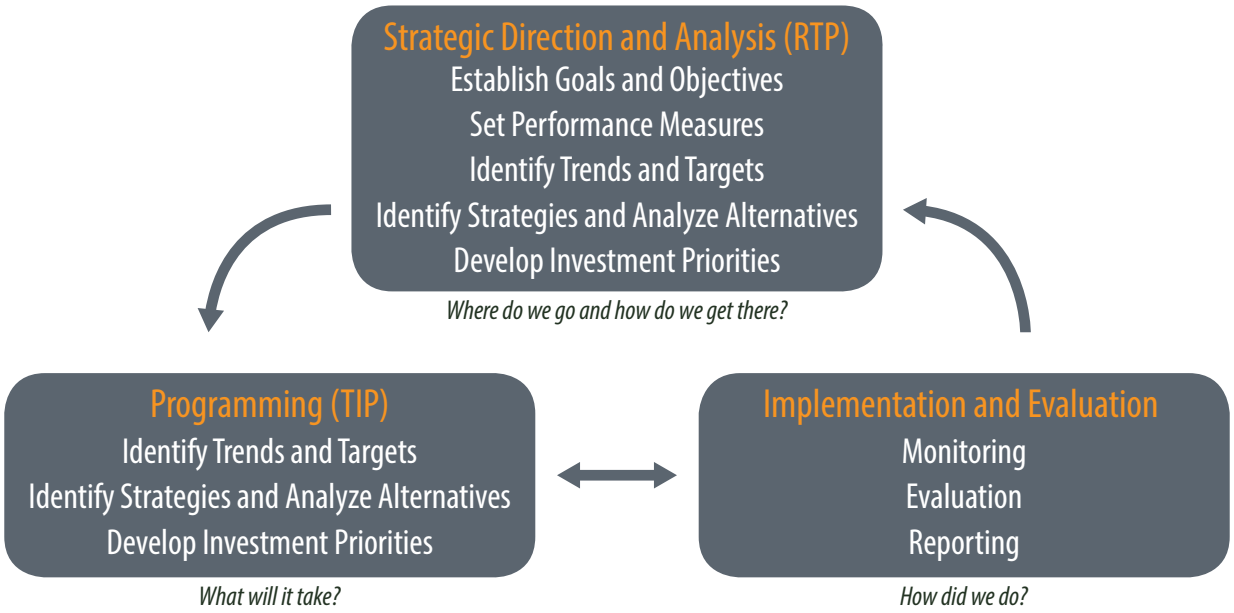
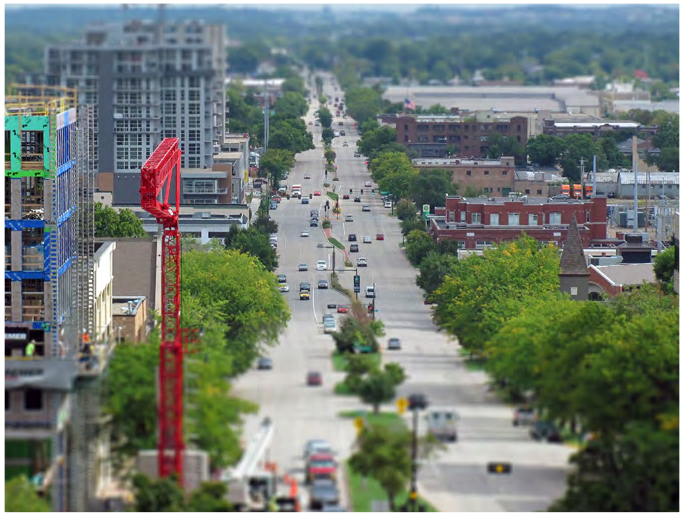


Figure 1-4: Performance-Based Planning and Programming Framework

THE PLANNING PROCESS

What is the Regional Transportation Plan?

The RTP is an integrated, multi-modal plan that articulates how the region intends to manage and operate its multi-modal transportation system (including transit, highway, bicycle, pedestrian, and other modes) to meet the region's economic, transportation, development, and sustainability goals. The RTP defines the transportation goals for the region and specifies the policies, projects, and strategies that will achieve these goals. Additionally, the plan ties goals to performance measures and sets performance goals to track the region's progress in meeting plan goals. Further, a board-approved and FHWA-accepted RTP is required for a metropolitan area to be eligible to receive federal funding for transportation projects.



The RTP acts as a transportation investment guide that MATPB, local jurisdictions, and the Wisconsin Department of Transportation (WisDOT) use to ensure a unified regional transportation network. As a "fiscally constrained " plan, the RTP must demonstrate that the projects listed in the plan can be implemented using committed, available, or reasonably available revenue sources. The RTP must be updated every five years and cover a minimum of 20 years.

The RTP is based upon and designed to support CARPC's regional land use policy plan and local comprehensive plans for growth and development.

Plan Development Process

The RTP was developed using a process that can be broken down into various steps including:

- Establish a regional vision and goals by engaging the public and stakeholder groups in a robust involvement process
- Perform an existing conditions analysis in which trends related to demographics, the economy, land use development, travel, and transportation system performance are examined and their relationship to plan goals and performance measures established
- Develop population and employment forecasts for the planning period
- Analyze the existing conditions in combination with forecasts to develop improvement strategies and projects and determine the capital requirements, operational strategies, and land use policy changes that may be needed in combination with these strategies and projects
- Evaluate and prioritize the strategies and projects in order to ensure consistency with plan goals and make progress towards performance targets

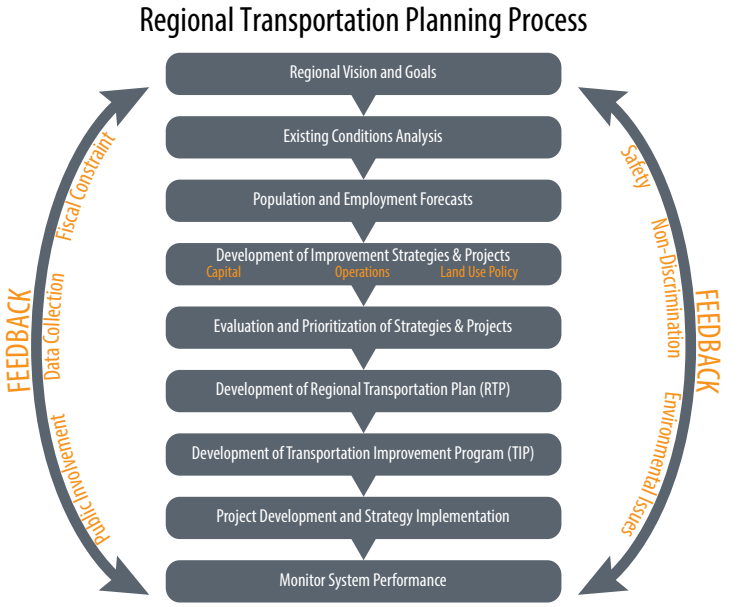


Figure 1-5: Regional Transportation Planning Process

Additionally, while preparing the RTP the following National Planning Factors guided the planning process:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency
- Increase the safety of the transportation system for motorized and non-motorized users
- Increase the security of the transportation system for motorized and non-motorized users
- Increase accessibility and mobility for people and freight
- Protect and enhance the environment, promote energy conservation, and improve the quality of life for the community
- Promote consistency between transportation improvements and planned State and local growth and economic development patterns
- Enhance the integration and connectivity of the transportation system for all modes
- Promote efficient system management and operation
- Emphasize the preservation of the existing transportation system
- Enhance travel and tourism
- Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of transportation

Once these steps were completed, a financial capacity analysis was performed to ensure that any recommendations made in the RTP could be completed between now and 2050 using cost and revenue estimates. The draft RTP was then submitted to MATPB policy board for adoption.

MATPB adoption of the RTP demonstrates regional agreement upon the transportation vision for the metropolitan area. Upon adoption, the RTP implementation and performance measurement begin. Implementation can include building new facilities, adding transit service, implementing traffic and transit operational improvements, adding new trails, adopting policies, and completing further studies to refine improvements or strategies recommended in the plan.

Plan Development Timeline

The development of the RTP took place along a timeline that began in the fall of 2015 and concluded in the spring of 2017, with a public engagement process taking place concurrently. While many engagement activities were timed with plan development steps, others, such as social media and website updates and committee meetings, occurred throughout the planning process.

In the fall and winter of 2015, MPO staff began to collect data, analyze existing conditions, and prepare growth forecasts. While this was occurring, MATPB partnered with CARPC and the City of Madison to conduct the Madison Area Regional Values and Priorities survey in an effort to learn more about the values and concerns area residents.

Early 2016 was spent developing goals and policy objectives based on feedback from the first series of public information meetings that were held during that same time period. The RTP online engagement tools were also launched at this time.

During the summer and fall of 2016, MATPB staff used information obtained from community involvement activities (such as the earlier public meetings and survey tools), committee meetings, and information gathered previously in the planning process to develop improvement projects and strategies. At this time, the RTP began to be drafted.

In the fall and winter of 2016, the second series of public engagement activities took place. The meetings sought feedback on the improvement projects and strategies that MPO staff developed, as well as suggestions for additional projects. Feedback from these activities helped to inform the prioritization of projects and strategies that took place during this time. During the same time period, the MPO launched the online transportation budgeting tool to learn more about how area residents would like to see their transportation dollars spent.

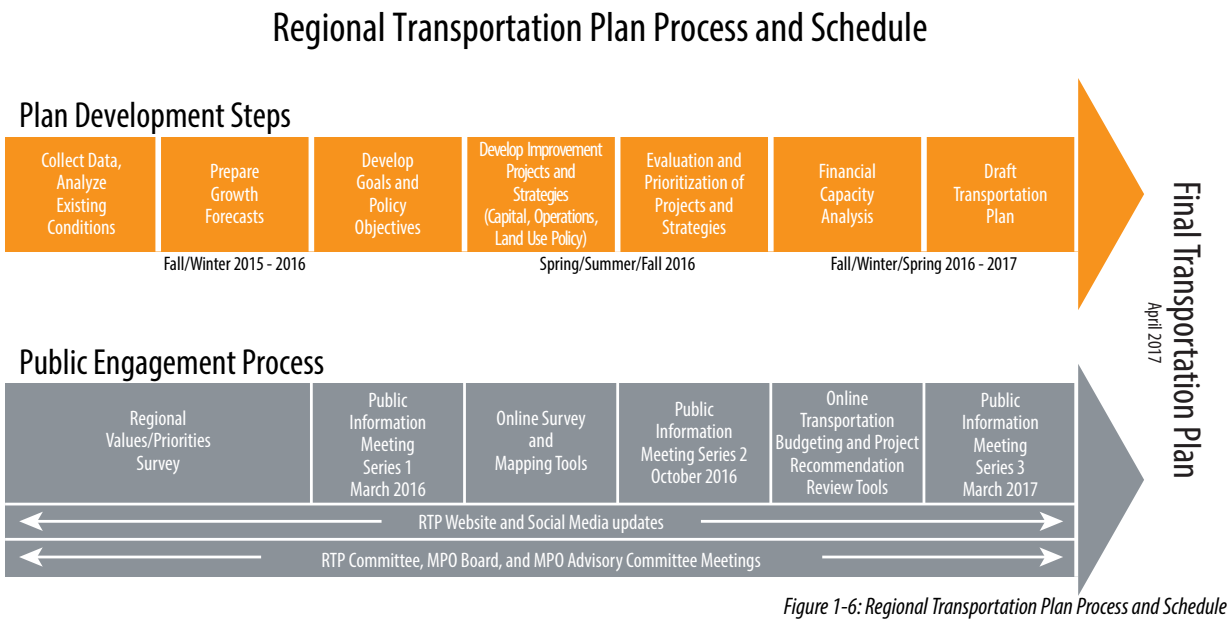


Figure 1-6: Regional Transportation Plan Process and Schedule

In the winter 2016 through the spring of 2017, staff completed a financial capacity analysis. This analysis determined which projects and strategies from the prioritized list would be included in the plan based on available funding. Once prioritized, the draft RTP was completed. During this same period environmental justice and environmental analyses of the draft RTP were completed to evaluate the impacts of the RTP on minority, low-income, and autoless households, and screen major projects for potential environmental impacts. The draft RTP was then presented at a public meeting, RTP Advisory Committee/TCC/CAC meetings, and the MPO board. Feedback from these meetings was incorporated into the final draft RTP, which was, in turn, approved by the MPO board on April 5, 2017.

RELATIONSHIP TO OTHER PLANS AND STUDIES

Transportation planning is a continuous process. The RTP builds upon a number of other planning efforts, studies, reports, and programmed transportation projects. Where applicable, the RTP has incorporated recommendations and policies from current plans including (but not limited to):

MPO Plans and Studies

2035 Regional Transportation Plan Update (2012)



MATPB's previous RTP. The 2035 RTP Update was a minor update to the RTP 2030 (2006) to account for new and modified land use plans, growth and development, new household, employment and traffic forecasts, and other changes and trends affecting the system since the RTP 2030 was adopted. As with all RTPs, it is an integrated, multi-modal system plan that provides the overall framework for transportation planning and investment decision making in the region. It identifies transportation projects and strategies or actions to be implemented.

Bicycle Transportation Plan (2015)

The Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County is a comprehensive bicycle plan to serve as a blueprint for continuing to improve bicycling conditions and increase bicycling levels throughout Dane County. The planning horizon is 2050. It provides a framework for cooperation between state agencies, Dane County, and local governments in planning for and developing bicycle facilities and programs. It is intended to educate citizens and policy makers on bicycle transportation issues and the needs of bicyclists as well as present resources for planning, designing, and maintaining bicycle facilities. The plan is a component of MATPB's RTP.

Madison Area Bus Rapid Transit Study (2013)

This feasibility study investigated how Bus Rapid Transit (BRT) might be used in the Madison Area. This study investigated four corridors radiating from Central Madison – west, south, east, and north – connected by a central spine through the Isthmus. BRT is a fast, frequent, high-capacity, limited-stop transit service that offers an improved rider experience on busy travel corridors. It offers many similar advantages to rail transit. The study identified a proposed system, provided cost and ridership estimates, and identified next steps for potential implementation of BRT.

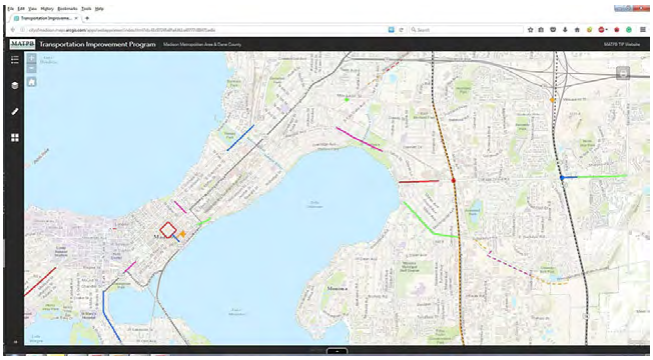
2017-2021 Transportation Improvement Program (2016)

The Transportation Improvement Program (TIP), which MATPB updates annually, is a coordinated listing of short-range transportation improvement projects anticipated to be undertaken in the next five-year period. The TIP is the mechanism by which the long-range RTP is implemented, and represents the transportation improvement priorities of the region.

Projects within MATPB Planning Area must be included in the TIP in order to be eligible to receive federal funding assistance. Outer county area projects are also listed for information and coordination purposes. The list is multi-modal. In addition to streets/roadways, it includes transit, pedestrian, bicycle, parking, and rideshare/transportation demand management projects.

The coordinated listing of projects in the TIP is a cooperative effort by state and local implementing agencies and the staff of MATPB, and is primarily based upon capital improvement programs and budgets. Implementing agencies submit their lists of proposed projects to MATPB staff to coordinate into a comprehensive list of proposed transportation improvements, with information about project scope, cost timing, etc. The listing is subject to review by local units of government, MATPB Technical Coordinating Committee (TCC), and MATPB. Opportunities are also provided for public involvement and comments.

The TIP is not a final schedule of project implementation. The time frame shown in the TIP is a "best estimate." The timing of projects can change due to delays in project development activities, changes in implementation priorities, and other factors. Annual updates to the TIP allow for these adjustments to project schedules and changing transportation improvement priorities. In addition, the TIP may be amended after it is adopted in order to add or delete projects, change project timing, or accommodate cost, phasing, or scope changes to a project. These amendments are usually minor. If a major change were to be adopted, an opportunity for formal review and comment would be provided.



An image from the Transportation Improvement Program interactive website. Click on the image to view the website.

MATPB Performance Measures Report (2016)

The Performance Measures Report measures progress towards regional transportation goals, identified in the RTP, using data from a variety of sources. The report, which is released annually, is used along with the TIP and RTP in the new performance-based planning process.



Cover of MATPB Performance Measures Report. Click on the image to view the report.

2013-2017 Transit Development Plan (2013)

The Transit Development Plan (TDP) for the Madison Urban Area is a short- to medium-range strategic plan intended to identify transit needs and proposed improvements and studies over a five-year planning horizon. MATPB is responsible for developing and maintaining the TDP. MATPB works in close cooperation with Metro Transit and other transit providers, funding partners, and jurisdictions in the Madison area to develop the plan. The TDP is developed within the overall framework of the long-range RTP.

Congestion Management Process (2011)

Metropolitan Planning Organizations with planning area populations over 200,000 are designated as Transportation Management Areas (TMA) by FHWA. In these areas, a Congestion Management Process (CMP) must be developed and implemented as a part of the metropolitan planning process. The CMP is an 8-step process:

- Develop Congestion Management Objectives;
- Identify Area of Application;
- Define System or Network of Interest;
- Develop Performance Measures;
- Institute System Performance Monitoring Plan;
- Identify and Evaluate Strategies;
- Implement Selected Strategies and Manage Transportation System; and
- Monitor Strategy Effectiveness.

MATPB developed its first CMP in 2011 based on a cooperatively developed and implemented metropolitan-wide strategy that provides for the safe and effective management and operation of the transportation system. Strategies from the CMP are incorporated into the RTP and TIP. Strategies used to manage travel demand, reduce single occupant vehicle (SOV) travel, and improve transportation system management and operations are all to be considered, as well as those that explicitly address bicycling and walking.

Madison Metro Transit Bus Size Study (2014)

The Bus Size Study contains a detailed analysis of Metro Transit bus routes to determine the suitability of larger or smaller vehicles for different routes on the system. The study includes supplemental analysis on the introduction of larger or smaller buses into the fleet, including the financial implications of such a move, an analysis of whether or not existing bus maintenance facilities and stops can accommodate larger buses, and the effects larger buses would have on vehicle scheduling and operations.

WisDOT Plans and Studies

Connections 2030 (2009)

Connections 2030 is WisDOT's long-range transportation plan for the state of Wisconsin. This plan addresses all forms of transportation over a 20-year planning horizon: highways, local roads, air, water, rail, bicycle, pedestrian, and transit. The plan outlines priority projects and studies within the metropolitan planning area.

Wisconsin State Freight Plan (2017)

The State Freight Plan is WisDOT's first attempt at articulating a statewide vision for multimodal freight transportation. The plan includes five key elements: linking transportation investments to economic development activities, placing Wisconsin within a national and global context, engaging and reflecting the interests of a wide array of freight stakeholders, implementation - from planning to project development and programming, and performance measures and management. Local freight routes were ranked as part of the planning process.

Madison Beltline Study (ongoing)

The Madison Beltline Study is a three part study process that will focus on improving safety and mobility for all modes of travel while reducing congestion and limiting social, cultural, and environmental impacts. An origin-destination study was completed in 2012. WisDOT began a planning and environmental linkages (PEL) study for the corridor in 2013. A National Environmental Policy Act (NEPA) study will follow the completion of the PEL Study.

U.S. Highway (US) 51 Stoughton Road Corridor Study (ongoing)

This study is evaluating long-term alternatives to address the safety, congestion, and gaps in the bicycle and pedestrian facility network along this corridor. This study will follow a phased implementation approach that will identify sections of the corridor for construction and potential timing. Interim improvements may be needed for sections of the corridor in subsequent phases in order to meet the project purpose and need until construction of those phases can occur.

US 51 Corridor (Stoughton – McFarland) Study (ongoing)

This study is evaluating alternatives that will improve safety and congestion along the corridor, and address needs of bicyclists and pedestrians. Improvements in the corridor are being addressed in an environmental assessment (EA) to identify near-term improvements. A Tier 1 environmental impact statement (EIS) to analyze long-term improvements was suspended because of the unlikelihood of funding being available in the near future for a major capacity expansion project. The US 51 study corridor is an important regional and commuter route and serves as an important link to the Madison area and beyond.

US 12 Freeway Conversion Study (ongoing)

This corridor study examines a 6.1 mile stretch of US 12 in the northwestern portion of the MPO planning area. The route is part of Wisconsin's National Highway System and provides a parallel route from the Madison metro area to I-39/90/94. The study aims to develop an alternative that will increase highway functionality and safety along corridor. Dane County's North Mendota

Parkway Study intends to tie into US 12 for the western terminus. The environmental documentation is on schedule to be completed in the Summer of 2017. WisDOT intends to initiate a final official mapping of this corridor phase in 2018.

US 18/151 Freeway Conversion Study (ongoing)

This study examines a 28-miles portion of US 18/151 in portions of Iowa and Dane counties, from Dodgeville to Verona, to develop a long-term plan for freeway conversion. This study will result in the eventual removal of all direct local road and driveway access onto US 18/151. Originally completed in 2014, an official re-evaluation of the environmental document is currently underway, focusing on the Barneveld area, which will be followed by the adoption of the official map.

I-39 & US 12/18 Madison Beltline Interchange (BIC) Study (ongoing)

The purpose of this project is to improve the overall safety of the interchange by improving its geometrics, providing additional capacity to accommodate increased future traffic volumes, and enhance connectivity with the regional transportation network in the area. The Beltline Interchange was included in the 2010 finding of no significant impact (FONSI) for the I-39/90 expansion project, however due to expanded study limits and unique natural and cultural resources an environmental impact statement is currently being prepared for the interchange.

WIS 19 Safety and Operations Study (2016)

WIS 19 is an important regional route serving the northern metropolitan area of Madison, functioning as a connector to the I-39/90/94, US 151, and US 12 corridors. The study analyzed safety and operational issues, including access, to produce a corridor management plan that identifies corridor deficiencies, in addition to improvement recommendations, to extend the highway's useful life.

WisDOT Southwest Region Park-and-Ride System Study (2015)

WisDOT Southwest Region initiated the Southwest Region Park-and-Ride System Study to provide more efficient and sustainable commuting choices and reduce traffic volumes on the state highway system by locating park-and-rides at optimal locations. The first step in the location selection process is identifying areas where park-and-ride lots may be practical, with potential to attract users and meet WisDOT's park-and-ride program goals. The purpose of this report is to present the screening methodology for assessing the most efficient locations for future park-and-ride facilities in the sixteen county study area of the Southwest Region.

Local Plans and Studies

CARPC Future Urban Development Area (FUDA) Plans

FUDA is a collaborative, locally-driven effort among neighboring jurisdictions and the Capital Area Regional Planning Commission. The purpose is to protect vital natural resources, promote efficient development, and preserve farmland through cooperative planning for long-term growth. FUDA provides additional resources that local communities may use to update their comprehensive plans.

Madison in Motion – Sustainable Madison Transportation Master Plan (2017)

Madison in Motion, the City of Madison's Sustainable Madison Transportation Master Plan, will guide future transportation decisions in Madison, in order to help make Madison a more walkable, bikeable, and transit-oriented city. Madison in Motion will build on adopted transportation and land use plans to improve coordination, connectivity, and transportation choice while establishing a framework to strengthen neighborhoods with context-appropriate future development.

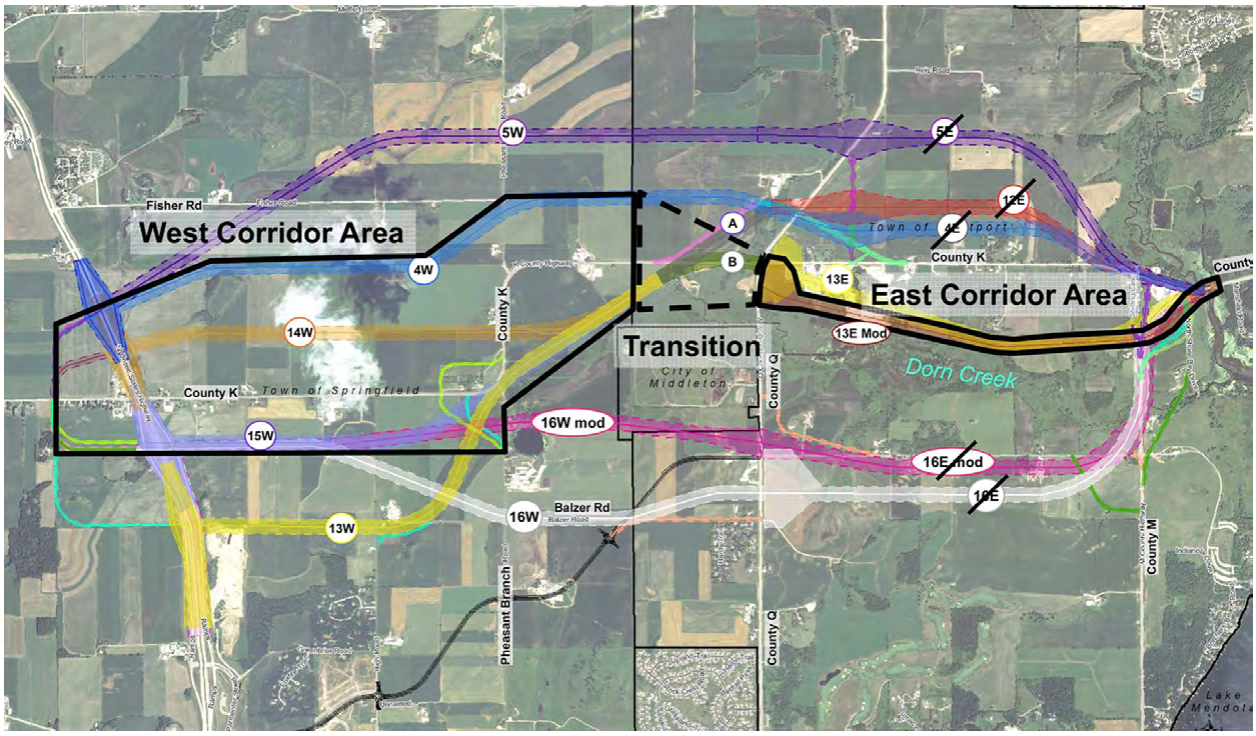


Dane County's North Mendota Parkway Study (2009)

The North Mendota Parkway Study developed a series of recommended study areas for a future north-metro parkway route:

- An eastern corridor area between County Highway M and County Highway Q;
- A broader western corridor area between the Town of Westport / Town of Springfield line and U.S. Highway 12, and;
- A transition area to connect the eastern corridor and western corridor areas.

Additionally, the study recommended a natural resource area boundary to protect the environmental, water, scenic, and recreation resources in the North Mendota area. The plan was adopted and incorporated into the Dane County Parks and Open Space Plan; however, capital funds have not yet been identified to construct this route.



North Mendota Parkway

STAKEHOLDER INVOLVEMENT AND PUBLIC OUTREACH

The intent of the RTP is to offer a vision and blueprint for the future of the transportation network in the Madison area. To develop this vision and find consensus between completing interests, it is important to have a robust dialogue between the community, stakeholders, and local officials. MATPB staff worked to facilitate opportunities for all interested parties to participate in the planning process and attempted to make that process more inclusive for those that may not feel comfortable or have the time for traditional forms of participation.

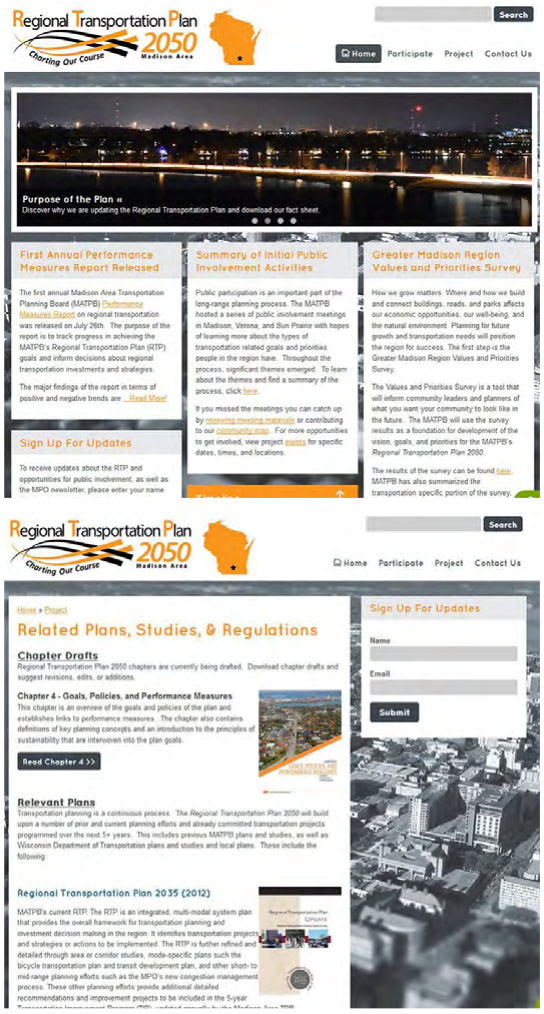
The public involvement process for RTP 2050 included:

- An interactive public participation website
- A RTP advisory committee made up of local elected officials and community leaders
- A community values and priorities survey
- Three series of three public involvement meetings
- MATPB newsletter updates

Specific materials delivered during the involvement process can be found in Appendix I.

Public Participation Website

At the start of the planning process, MATPB worked with a consultant to create an interactive website for the RTP in an effort to increase public participation and interest in the planning process. The website, MadisonAreaRTP.com, provided project news, descriptions of the plan development process, a listing of RTP related boards and committees and corresponding membership, a timeline of public engagement activities and meetings, links to related plans and studies, information about MATPB, and interactive tools at specific points in the planning process.



Images of the RTP 2050 website.

RTP Committee

An ad hoc RTP Advisory Committee was created to help guide development of the plan. The committee consisted of primarily elected officials, citizen members of local transportation related committees, and others representing important stakeholders and constituencies in the region. Membership included:

- Stephen Flottmeyer – Planning Chief, WisDOT SW Region & MPO Policy Board Member
- Jennifer Sarnecki – Statewide Planning Chief, WisDOT
- Chuck Kamp – General Manager, Metro Transit & MPO Policy Board Member
- Paul Esser - Mayor, City of Sun Prairie
- Hans Hilbert - Alder, City of Middleton, District 7 & Chair of the Ped/Bike/Transit Committee
- Elizabeth Doyle - Alder, City of Verona, District 1 & Council President
- Kim Lobdell - Chair, City of Fitchburg Transportation & Transit Committee
- Carl Chenoweth - Dane County Supervisor, District 35 & Member, Commission on Economic and Workforce Development
- Rod Clark, Member – Village of McFarland, Finance &Ad Hoc Transportation Needs Committees
- Kevin Little – Managing Director of Economic Development, Greater Madison Chamber of Commerce
- Amanda Larson – YW Transit Program Coordinator, YWCA Madison
- Dave Porterfield – Real Estate Developer, Movin' Out, Inc.
- Jessie Lerner – Executive Director, Sustain Dane
- Ken Golden – Member of CARPC, Member of City of Madison Transit & Parking Commission, Member of MPO Policy Board
- Betty Hicks – Member, City of Madison Disability Rights Commissions and ADA Transit Subcommittee
- Tom Wilson - Attorney/Administrator/Clerk - Treasurer, Town of Westport
- Chad Lawler - Director of Government Relations & Advocacy - Madison Area Builders Association
- Susan Schmitz - President - Downtown Madison, Inc.

The committee helped identify important issues facing the regional transportation system and how those issues impact their constituencies. Additionally, the committee provided feedback on plan goals and policies, public outreach strategies, project recommendations, and chapter drafts.

Community Values and Priorities Survey

MATPB partnered with the Capital Area Regional Planning Commission (CARPC) to conduct the Priorities and Values Survey of the greater Madison region, with the support of the consulting firm Heart+Mind Strategies. The scientific survey of 457 residents was conducted December 8-22, 2015. Midway through the scientific study, an open survey was conducted, garnering 1,179 responses, primarily from the Madison urban area. The purpose of the survey was to determine regional priorities, values, and motivations that could be used to guide the planning process in the area. The survey asked general questions about the region, as well as transportation-specific questions.

The key findings of the survey were as follows:

1. Madison region residents enjoy a high quality of life and have a relatively positive outlook – well above the national average. However, residents believe that the local economic recovery has been sluggish.
2. While growth is viewed as inevitable, most believe it brings benefits and should be encouraged.
3. Education (K-12 and Higher) and agriculture are seen as the top regional equities. Jobs, income inequality, affordable housing, crime, and access to healthcare are top regional challenges.
4. Financial wellbeing, personal security, and a sense of community are the dominant personal values of residents in the region.
5. High support for regional visioning (or planning) that focuses on safe neighborhoods, affordable housing, revitalization and reinvestment to reduce crime, and improving base infrastructure.
6. Strong support for regional transportation investment, particularly increases in road maintenance, and improvement/ expansion of public transportation.

Specific to transportation, the survey asked participants if they agreed with a number of growth management and transportation strategies. Some of the most popular strategies included "Improving Neighborhood Walking and Biking Safety/ Convenience" (85% favorable), "Improving Base Infrastructure" (79% favorable), and "Investing in High Poverty/Crime Areas" and "Revitalizing Old Neighborhoods" (both 77% favorable).

Participants were also asked if having a long-range regional transportation plan was important, with 67% saying that it was "Extremely Important" or "Very Important." Though participants viewed planning to be important, only 33% believed that the planning and implementation of transportation solutions was going "Good" or "Excellent."

Participants were then asked about what they felt the appropriate level of investment was for a variety of transportation projects across all modes. Overall, participants desired increased investment in road maintenance, new and expanded highways, and new and expanded transit service.

When asked about the top transportation priorities, participants said that using the latest transportation technology, locating



Values and Priorities Survey presentation at the Madison Public Library - Central Library on Feburary 16th, 2016. Photo credit: CARPC.

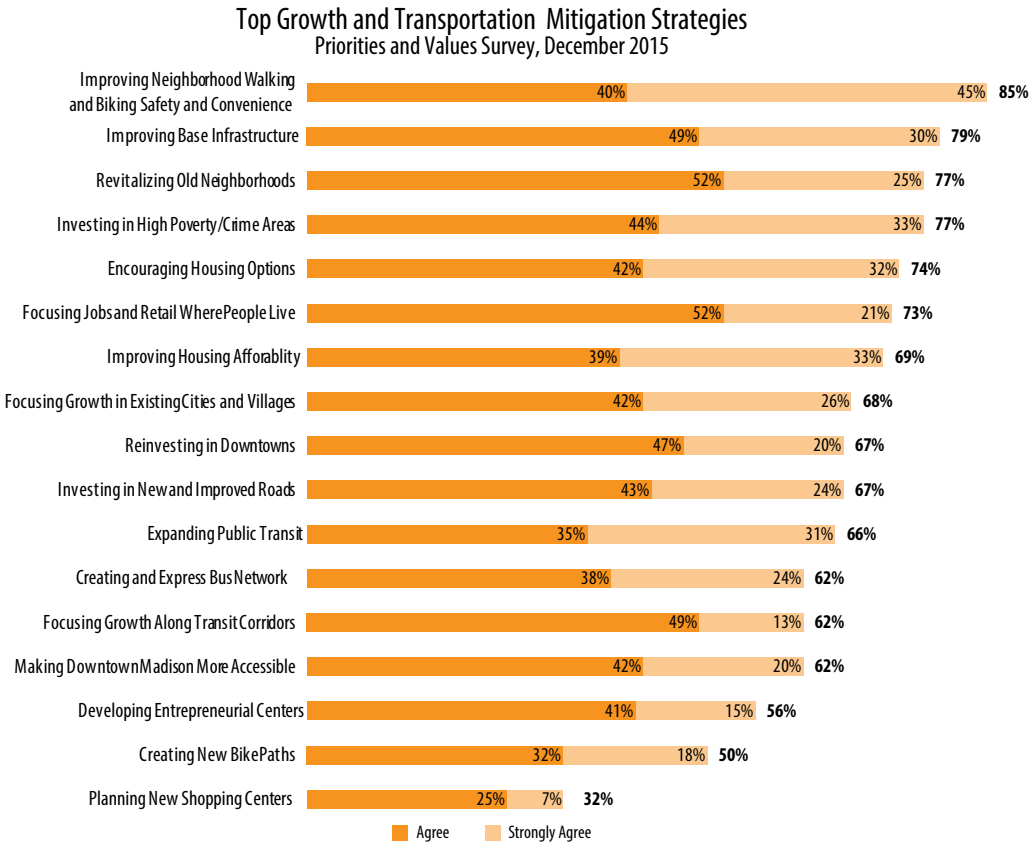


Figure 1-7: Top Growth and Transportation Mitigation Strategies

attractions near transit, ensuring that the transportation network supports the regional economy, improving roadway maintenance, and expanding public transit ranked highly. Interestingly, the lowest rated priority was improving biking and walking infrastructure.

When asked about the performance of specific aspects of the transportation system, participants responded that biking and walking infrastructure, roadway maintenance, locating attractions near transit, and roadway capacity were performing well. The lowest rated included "high-capacity transit" and "incentives for driving alternatives," the former is unsurprising because the region does not currently have high-capacity transit service. There is a correlation between the priorities and perceived network performance, with some high performers not being high priorities, such as biking and walking infrastructure.

Finally, participants were asked if they supported use of local taxes to fund transit operations and improvements. Overwhelmingly, the region's residents support funding transit with local taxes. Residents were not specifically asked about support for a new local funding option, such as a Regional Transit Authority with ability to levy a sales tax.

Results from the survey were used to refine the RTP goals and policies, and to inform RTP recommendations.

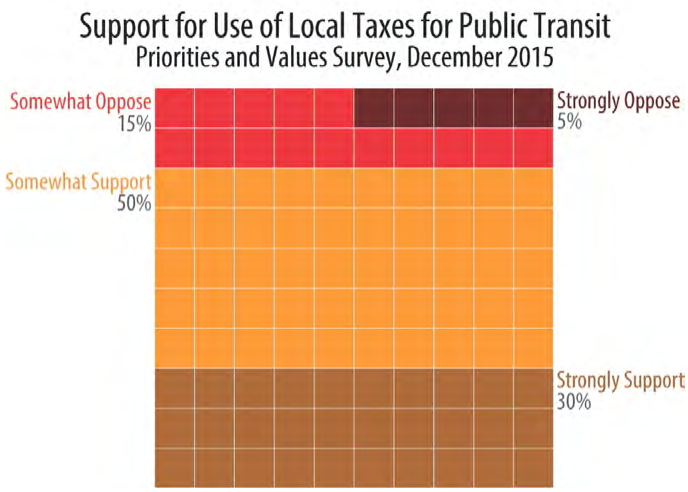


Figure 1-8: Support for Use of Local Taxes for Public Transit

Public Involvement Meetings

Locations and Context

MATPB made a priority of engaging the public in the planning process, engaging people at nine outreach meetings during the three phases of the project:

Series One: Introduction to the Planning Process and Goal Setting. March 2016.

- the Urban League of Greater Madison,
- City of Verona Fire Department
- the Sun Prairie City Hall.

Series Two: Existing Conditions. October 2016.

- the Fitchburg City Hall,
- the Middleton City Hall, and
- the Warner Park Community Recreation Center in Madison.

Series Three: Recommendations. March 2017.

- the Madison Senior Center,
- the Waunakee Village Hall, and
- the Sun Prairie City Hall.

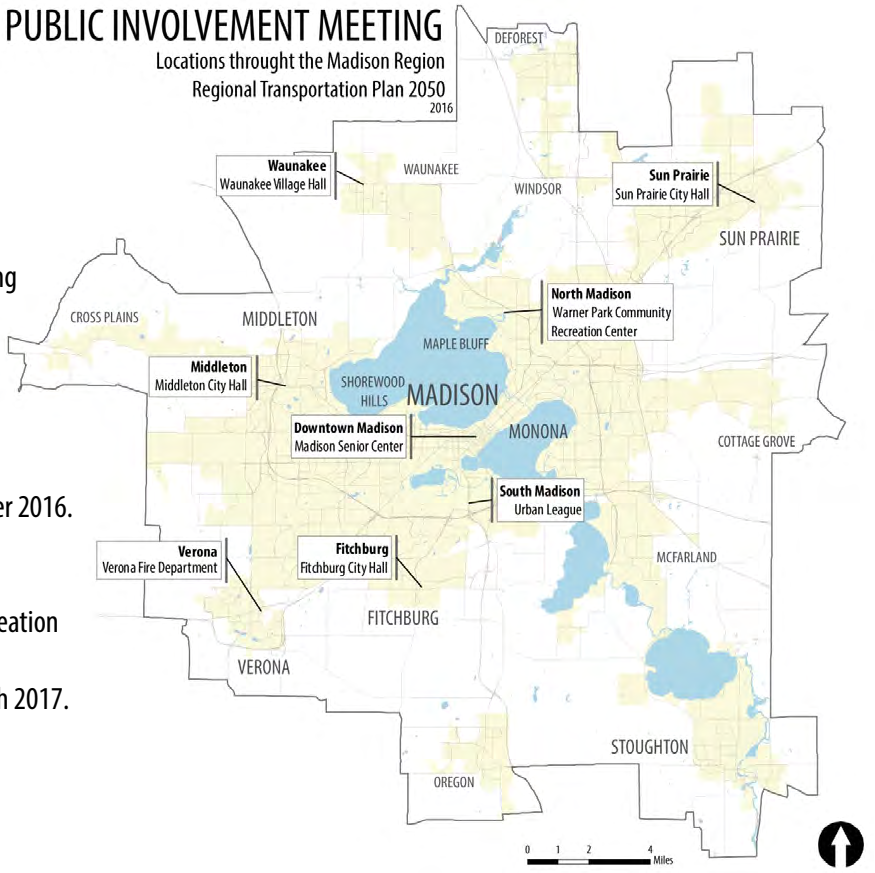


Figure 1-9: Public Involvement Meeting Locations

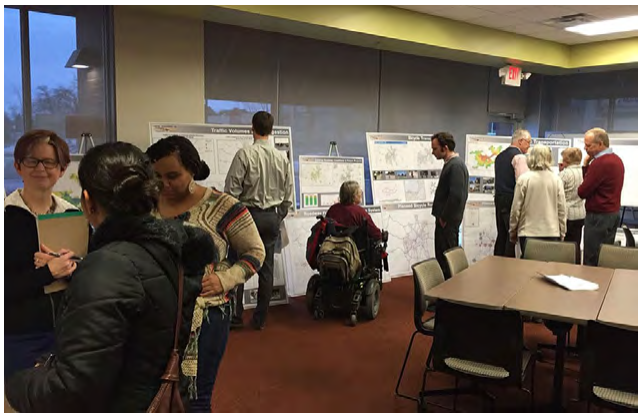
In addition to the involvement meetings, MATPB held a public hearing on the draft RTP 2050 during its March 1 board meeting in Madison.

Meeting Feedback

After each series of public involvement meetings, MATPB staff summarized the key takeaways and sentiments from the events. They are as follows:

Series One

- Transportation Funding– Strong support for Regional Transportation/Transit Authorities (RTAs) and alternative transportation funding mechanisms. An RTA would allow for truly regional transit service and allow for local service in suburban communities. If an RTA is not feasible, a use-based fee/tax could allow for funding of local projects and encourage more local control over the transportation network. Funding must be sustainable.
- The Economy – The link between transportation and the economy should be emphasized. There is a need for improved facilities/services providing connections



South Madison Public Involvement Meeting at the Urban League of Greater Madison on March 2, 2016.

between housing and jobs/destinations, particularly in areas outside of the central city.

- Equity – The equity goal should be more inclusive than currently defined.
- Mode Choice & Connectivity – Regardless of location, citizens should have the ability to choose between a variety of transportation options with the ability to live a "car-free" lifestyle, if desired. We should work to retrofit existing roads with bicycle and pedestrian facilities.
- Land Use – The transportation network should support efficient, compact land use patterns. Land use patterns that support transit should be encouraged. Where applicable, encourage retrofitting streets in areas of higher density and mixed-use development to support public transportation.
- Transit – Regional transit and local transit for suburban communities is desired. There is a strong desire to increase transit service frequency, capacity, and service area. Paratransit service areas should be expanded. Transit between suburban communities should be supported as well. Suburban communities should explore alternative forms of transportation – shared ride taxis, car sharing, and new technologies as they become available.
- Health & Safety – The definition of health in the plan goals should be expanded to include "improve access to healthy food." The links between health and safety should be strengthened.
- Technology – The transportation network should adapt to new technologies as they become available. Regionally, we must be aware of new technologies, such as autonomous transit, that could solve issues that are on the horizon, such as baby boomers' desire to age in place.
- MATPB will use the feedback from the meetings to inform plan development and to revise goals. New plan goals will be posted once they are available.



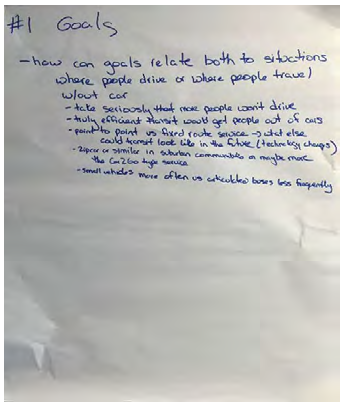
Presentation at the South Madison public involvement meeting on March 2, 2016.

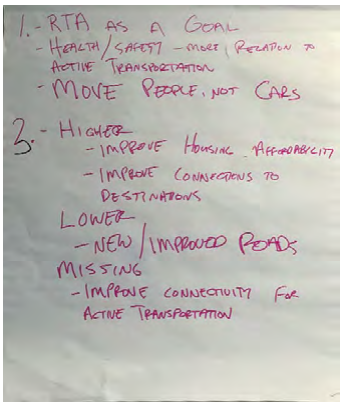


Group discussion at the Verona public involvement meeting held at the Verona Fire Department on March 3, 2016.



Sun Prairie public involvement meeting held at City Hall on March 8, 2016.





Participants helped to determine plan goals at the first series of public involvement meetings.



Involvement meeting at Warner Park in October 2016.



Inolvement meeting in Middleon in October 2016.



Involvement meeting in Fitchburg in October 2016.



Involvement meeting in Fitchburg in October 2016.

Series Two

The second series of engagement meetings focused on reviewing the existing and potential future transportation network. Attendees also had the opportunity to review a presentation that outlined the planning process and reviewed feedback from series one. Finally, attendees were given the opportunity to critique project recommendations and identify needs by providing feedback via a table activity.

Series Three and Public Hearing

The final series of engagement meetings involved presenting the draft plan and presentation boards to meeting attendees. Much like series two, attendees were given the opportunity to critique needs and recommendations identified in the plan, as well as give feedback about specific projects.

Major ideas and issues discovered in the public engagement sessions were incorporated into the RTP as appropriate.

MPO Newsletters

MPO staff prepared newsletters briefing the public on general MATPB happenings as well as RTP-specific news, updates, and results. Newsletters provided links to draft chapters, the RTP website, and RTP apps.



Madison Area T • P • B Transportation Planning Board

Moving the Region

Newsletter of the Madison Area Transportation Planning Board

March 2017

ARTICLES

- Draft Regional Transportation Plan Now Available
- WisDOT Cancels I-39/90/94 Study
- Park Street Corridor Connected Vehicle Pilot Project
- New Staff at MATPB

Stay in the know..... Like Us on Facebook

In Case You Missed It...

In 2015-16, Dane County Parks in partnership with the Madison Area Transportation Planning Board contracted with Toole Design Group to develop a county wide Bicycle Wayfinding Manual. The manual provides guidelines for communities to use for designing and implementing a uniform wayfinding and information sign system for the bicycle network throughout Dane County.

The project also included the development of six bicycle wayfinding plans for the Capital City Trail, Cannonball Path, Ice Age Junction Trail, Monona Lake Loop, University Avenue, and Military Ridge State Trail. The completed Wayfinding Manual and sample plans are now available on Dane County Parks website.

About US

Draft Regional Transportation Plan Now Available

The Madison Area Transportation Planning Board (MATPB) has completed the draft Regional Transportation Plan (RTP) 2050, culminating a planning process that began in 2015. The plan identifies transportation system needs and makes recommendations across all modes and seeks to coordinate investments of implementing agencies, including the Wisconsin Department of Transportation (WisDOT), Dane County, and local communities.

The robust planning process involved input from the public, standing boards and committees, and an ad hoc RTP Advisory Committee comprised of stakeholders from across the region. These groups helped to refine the plan throughout its development process, which included:

- Establishing a regional vision and goals;
- Examining demographic, economic, land use, and travel data, transportation system performance, and emerging technologies to identify trends that may impact the future transportation system;
- Developing population, household, and employment forecasts for the planning period;
- Analyzing the existing condition of the transportation system in combination with forecasts to develop improvement strategies, policies, and projects to address future travel demand; and
- Evaluation and prioritization of strategies and projects to ensure consistency with the regional vision and plan goals

Regional Transportation Plan 2050

Click on the image above to view the plan.

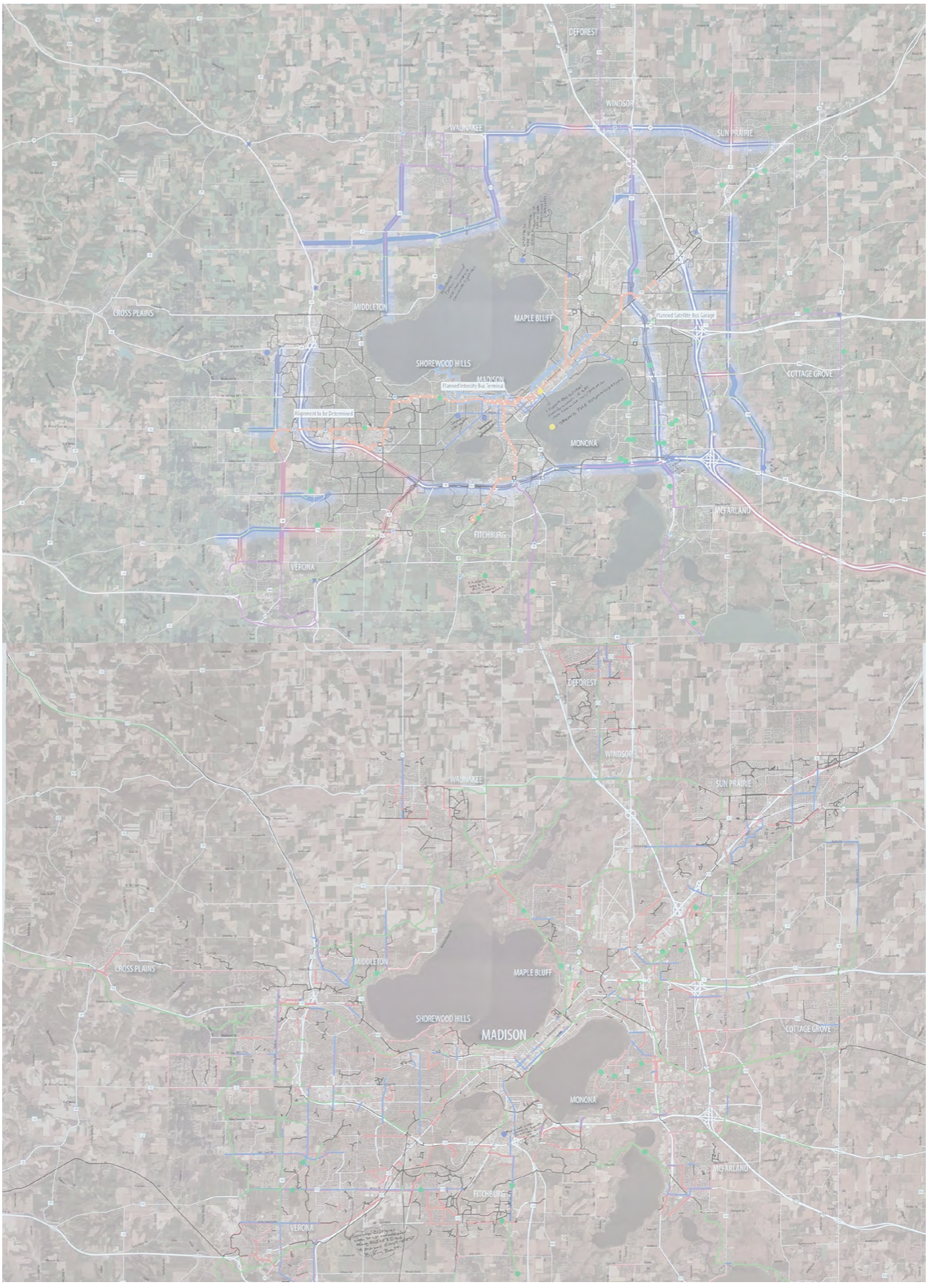
The draft RTP is available for review on MadisonAreaRTP.com. A final series of public information meetings was just completed. Comments are requested by March 22 to ensure incorporation into the final plan. The final RTP will be available after board adoption.

WisDOT Cancels I-39/90/94 Study

In late February the Wisconsin Department of Transportation and Federal Highway Administration announced the cancellation of the I-39/90/94 Study from Madison to Portage, citing a reprioritization of major transportation projects. The study had previously identified seven possible alternatives, including widening the existing Interstate as well as four new off-alignment corridors. The termination of the study removes all of these alternatives from consideration. A new environmental study will be initiated to evaluate the replacement of the Interstate bridges over the Wisconsin River in Columbia County, which was previously included in the I-39/90/94 Study.

39-90-94 INTERSTATE STUDY

MATPB newsletter. Click to view newsletters on MATPB website.


DEFOREST
WINDSOR
WAUNAKEE
SUN PRAIRIE
CROSS PLAINS
MIDDLETON
MAPLE BLUFF
Planned Satellite Bus Garage
SHOREWOOD HILLS
MADISON
Planned Intercity Bus Terminal
COTTAGE GROVE
Alignment to be Determined
MONONA
MCFARLAND
FITCHBURG
VERONA
DEFOREST
WINDSOR
WAUNAKEE
SUN PRAIRIE
CROSS PLAINS
MIDDLETON
MAPLE BLUFF
SHOREWOOD HILLS
MADISON
COTTAGE GROVE
MONONA
MCFARLAND
FITCHBURG
VERONA



CHAPTER 2:
NATIONAL & REGIONAL TRENDS AND FORECASTS

- Introduction
- Demographics
- Economics
- Land Use and Development
- Commuting Patterns
- Emerging Technologies

INTRODUCTION

National and regional trends and forecasts such as shifting demographics and growth provide insight into how best to invest in the transportation system to meet future needs while accommodating present needs. Demographic changes, commuting patterns, economic shifts, land use development patterns, and emerging technologies all influence the type, location, and amount of demand on transportation facilities and services and also pose potential equity considerations. The need to account for these changes is especially true in the greater Madison region – the fastest growing and fastest changing region in the state. The Madison area is out-pacing the rest of the state in all key economic indicators, including job creation, business growth, and construction activity.[1] The area's population growth is out-pacing the rest of the state and at the same time the population is becoming increasingly diverse.



Figure 2-1

DEMOGRAPHICS

Demographic projections have an impact on the type of solutions planned for the future transportation network. When coupled with commuting patterns, economic forecasts, and land use development patterns it is possible to prepare forecasts for future travel demand and identify issues and needs.

Population

The country's population continues to grow, with a majority of this growth occurring in the southern and western states. Wisconsin is growing at a slower pace than other states due to high out-migration without comparable in-migration of either domestic or foreign-born immigrants. However, Dane County and the City of Madison have deviated from that trend and are projected to continue to do so in the future with population continuing at a moderate rate. Dane County added nearly 100,000 new residents, while the City of Madison added nearly 41,000, between 2000 and 2015. This growth accounted for nearly ¼ of the state's growth over that time frame.

The population growth rate of Dane County as a whole outpaced the City of Madison's growth from 1990-2010 continuing a historical trend. As a result, the city's share of county population has decreased from 52.0% to 47.8%. This

Population Growth in Dane County and Madison

	Total Population			Change	
	1990	2000	2010	1990-2000	2000-2010
Dane County	367,085	426,526	488,073	16.2%	14.4%
City of Madison	190,766	208,054	233,209	9.1%	12.1%
City as % of County	52.0%	48.8%	47.8%		

Figure 2-2

Population Growth in Selected Communities

	Total Population			Change	
Community	1990	2000	2010	1990-2000	2000-2010
Cottage Grove, Village	1,131	4,059	6,192	258.9%	52.5%
Fitchburg, City	15,648	20,501	25,260	31.0%	23.2%
Madison, City	190,776	208,054	233,209	9.1%	12.1%
Madison, Town	6,442	7,005	6,279	8.7%	-10.4%
Maple Bluff, Village	1,352	1,358	1,313	0.4%	-3.3%
Middleton, City	13,785	15,770	17,442	14.4%	10.6%
Monona, City	8,637	8,018	7,533	-7.2%	-6.0%
McFarland, Village	5,232	6,416	7,808	22.6%	21.7%
Shorewood Hills, Village	1,680	1,732	1,565	3.1%	-9.6%
Stoughton, City	8,786	12,354	12,611	40.6%	2.1%
Sun Prairie, City	15,352	20,369	29,364	32.7%	44.2%
Verona, City	5,374	7,052	10,619	31.2%	50.6%
Waunakee, Village	5,897	8,995	12,097	52.5%	34.5%
Westport, Town	2,732	3,586	3,950	31.3%	10.2%

[1] Connect Madison, City of Madison Economic Development Strategy (Dec. 2016).

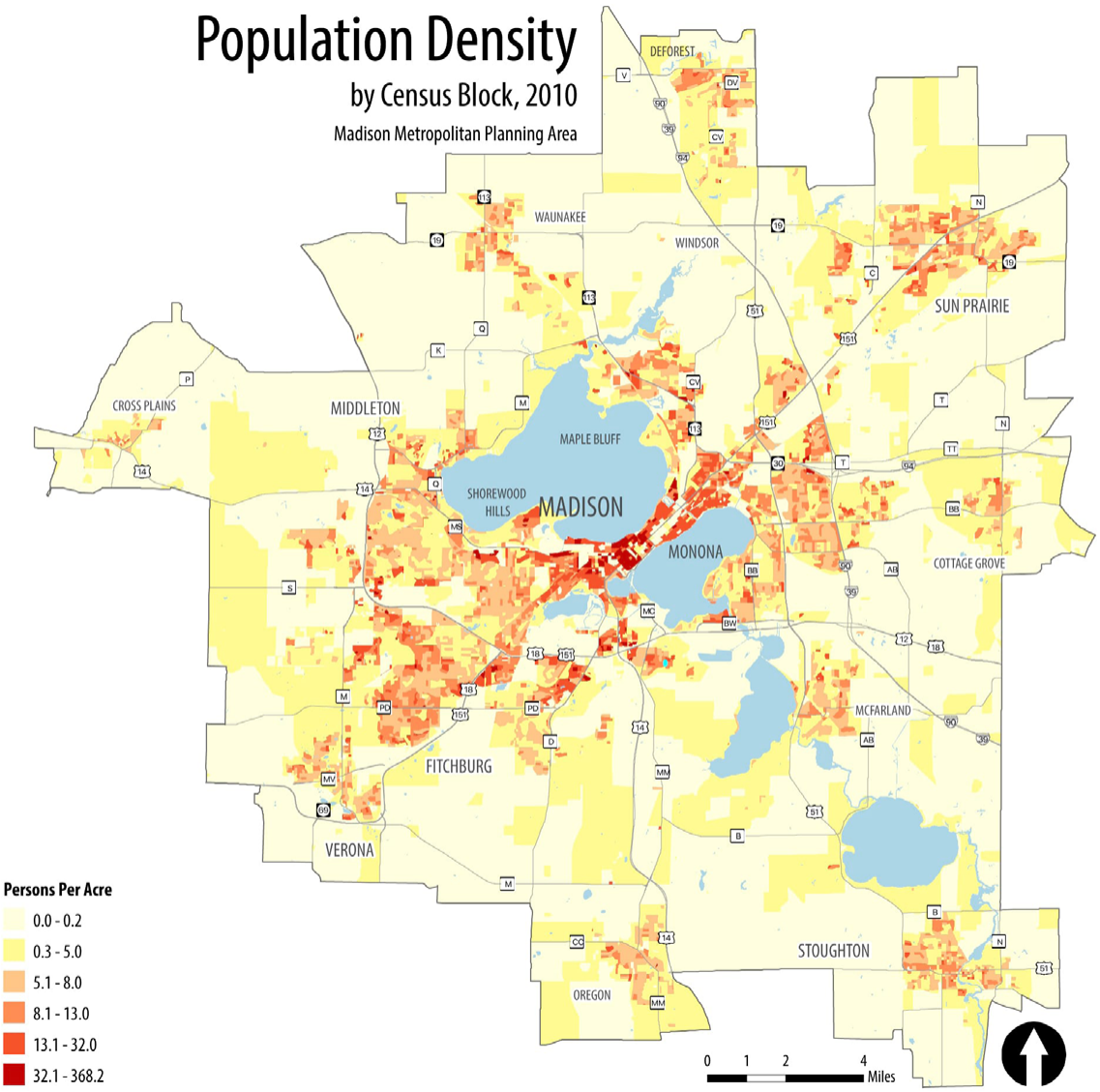


Figure 2-3: Population Density by Census Block, 2010

trend is expected to continue. Suburban cities and villages with the highest percentage growth rates over the past 25 years include Cottage Grove, Waunakee, Verona, and Sun Prairie. Paced by these communities and the DeForest/Windsor area, the larger outer urbanized areas are projected to grow by 59%, adding 55,000 new residents from 2010-2050. The population of the central urbanized area, including Madison, Fitchburg, Middleton, and McFarland, is projected to grow by 25% or 77,000 residents. The projected population growth in smaller urbanized and rural areas outside the Madison Metropolitan Planning Area is only expected to be about 17,000.

Figure 2-4

Madison Metropolitan Area Population

2010 Census and 2050 Forecast

Municipality	2010 Census Population	2010 Census % of County	2050 Forecast Population	2050 Forecast % of County	Change Number	Change Percent
Central Urbanized Area Total	302,224	62%	379,118	60%	76,894	25%
City of Madison	234,618	48%	292,522	46%	57,904	25%
City of Fitchburg	25,413	5%	34,370	5%	8,957	35%
City of Middleton	17,548	4%	24,571	4%	7,023	40%
Village of McFarland	7,855	2%	10,379	2%	2,524	32%
Larger Outer Urbanized Area Total	93,111	19%	148,375	23%	55,264	59%
City of Sun Prairie	29,364	6%	50,883	8%	21,519	73%
City of Stoughton	12,611	3%	14,366	2%	1,755	14%
City of Verona	10,619	2%	18,840	3%	8,221	77%
Village of Cottage Grove	6,192	1%	10,594	2%	4,402	71%
Village of Waunakee	12,097	2%	19,279	3%	7,182	59%
Northern (DeForest/Windsor)	12,997	3%	20,794	3%	7,797	60%
Village of Oregon	9,231	2%	13,619	2%	4,388	48%
Smaller USAs Total	26,740	5%	36,151	5%	9,411	35%
Rural Total	65,998	14%	73,785	12%	7,787	12%
County Total	488,073		637,429		149,356	31%

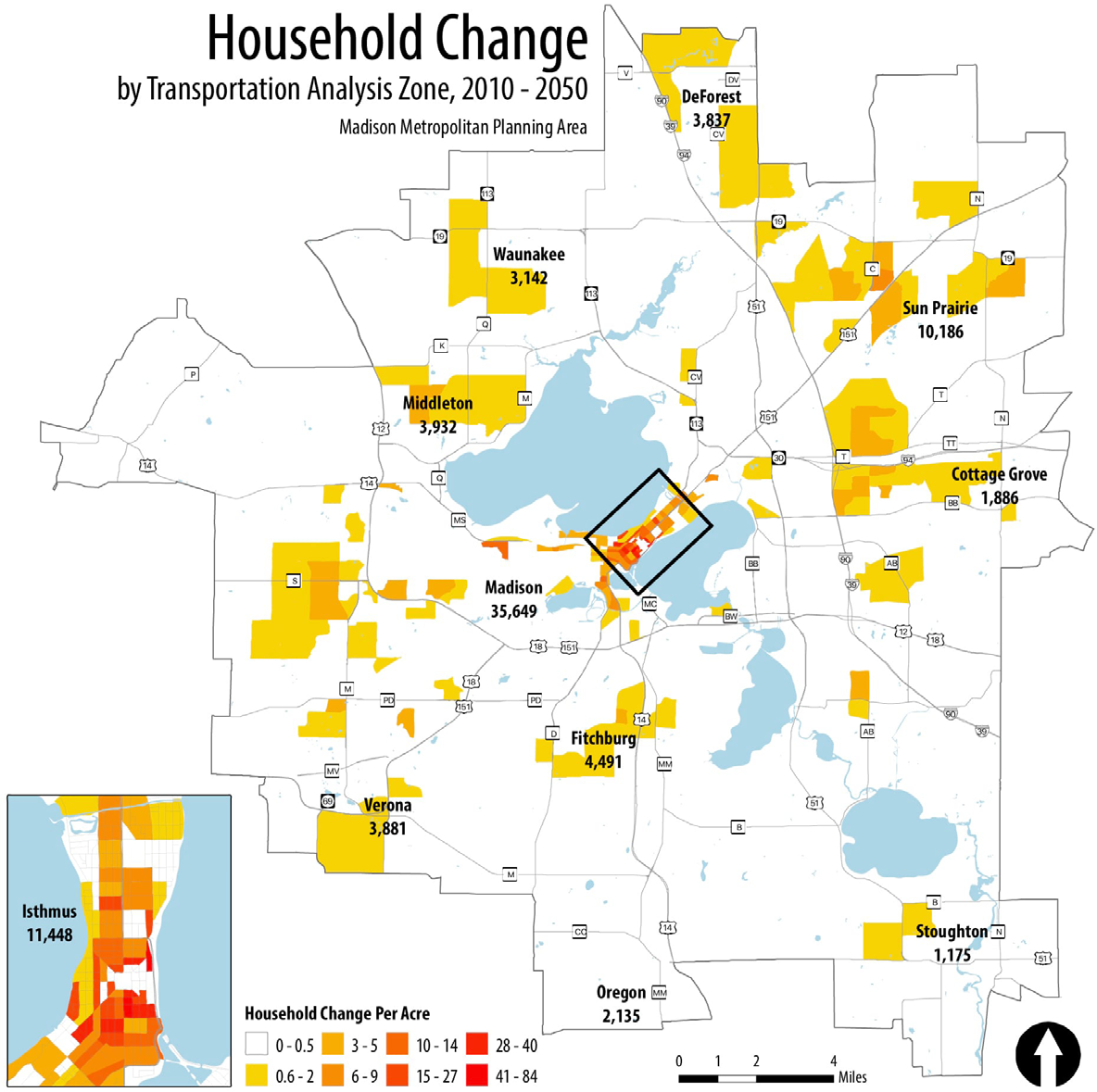


Figure 2-5: Change by Transportation Analysis Zone, 2010-2050

Households

While the population has continued to grow nationally and within the Madison region, the average size of a household has been in a decline. This decline has occurred for a number of reasons, including changing cultural norms, an increase in the percentage of single-person and two-person households, a reduction in the number of children each family is having, and an increase in elderly with the aging of the baby boomers. The US Census Bureau defines a household as "all the persons who occupy a housing unit as their usual place of residence. A housing unit is a house, an apartment, a mobile home, a group

Figure 2-6

Madison Metropolitan Area Households

2010 Census and 2050 Forecast

Municipality	2010 Census Households	2010 Census % of County	2050 Forecast Households	2050 Forecast % of County	Change Number	Change Percent
Central Urbanized Area Total	132,172	65%	177,828	62%	45,656	35%
City of Madison	103,132	51%	138,781	49%	35,649	35%
City of Fitchburg	10,015	5%	14,506	5%	4,491	45%
City of Middleton	8,085	4%	12,017	4%	3,932	49%
Village of McFarland	3,097	2%	4,268	2%	1,171	38%
Larger Outer Urbanized Area Total	36,164	18%	62,406	22%	26,242	73%
City of Sun Prairie	11,636	6%	21,822	8%	10,186	88%
City of Stoughton	5,133	3%	6,308	2%	1,175	23%
City of Verona	4,223	2%	8,104	3%	3,881	92%
Village of Cottage Grove	2,210	1%	4,096	1%	1,886	85%
Village of Waunakee	4,344	2%	7,486	3%	3,142	72%
Northern (DeForest/Windsor)	5,029	2%	8,866	3%	3,837	76%
Village of Oregon	3,589	2%	5,724	2%	2,135	59%
Smaller USAs Total	10,497	5%	15,850	6%	5,353	51%
Rural Total	24,917	12%	29,100	10%	4,183	17%
County Total	203,750		285,184		81,434	40%

of rooms, or a single room that is occupied as separate living quarters. The occupants may be a single family, one person living alone, two or more families living together, or any other group of related or unrelated persons who share living arrangements."

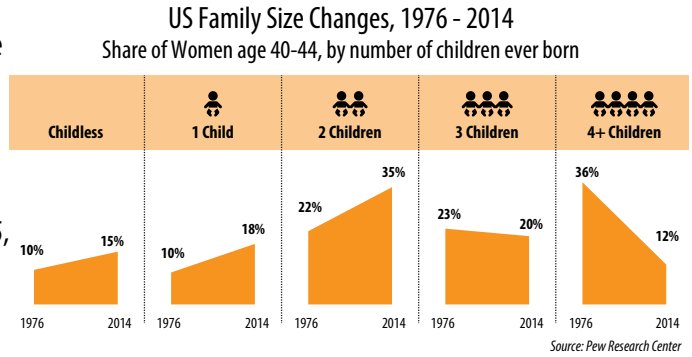


Figure 2-7: US Family Size Changes, 1976 - 2014

In 1970, the average US household size was 3.14. By 2015, the average US household size had fallen to 2.59. Here the trends have been similar – the average Dane County household size was 3.09 in 1970 and had dropped to 2.33 by 2010. Housing and household sizes are correlated with average house and household sizes larger in villages and towns, smaller in suburban cities, and the smallest in the City of Madison. The historic trend of shrinking household sizes is projected to continue in the future, with the City of Madison reaching an average household size of 2.03 by 2040, nearly 1 person less than 1970.

Average Household Size in Dane County Communities
Historical Census Data and Forecasts

	1970	1980	1990	2000	2010	Projections 2020	2030	2040
Towns	3.73	3.01	2.8	2.59	2.57	2.5	2.46	2.43
Villages	3.17	2.85	2.74	2.72	2.61	2.53	2.49	2.46
Small Cities	3.26	2.54	2.29	2.35	2.37	2.31	2.17	2.24
Madison	2.88	2.38	2.3	2.19	2.17	2.11	2.07	2.03
Dane County	3.09	2.56	2.46	2.37	2.33	2.27	2.23	2.2

Source: DOA

Figure 2-8: Average Household Size in Dane County Communities

Understanding trends in average household size along with other household characteristics is important because the makeup of households affects the demand for different types of housing and the location of that housing. For example, if the City of Madison has an average household size of 2.17 in 2010 and a population of 234,618, it can be surmised that over 108,000 housing units are needed to accommodate those residents. One of the ways that the City of Madison plans to accommodate future housing needs is through infill and redevelopment in existing and planning activity centers and in the downtown and Isthmus areas. In fact, infill and redevelopment areas such as the East Washington Avenue corridor are projected to accommodate well over 50% of all new households in the City of Madison between 2010 and 2050. Of those, around 11,500 are forecast to be located within the greater Isthmus area, more than even the City of Sun Prairie, the largest suburb. This is consistent with the trend over the past fifteen years and city policy.

Figure 2-5 on page 2-4 illustrates the areas with a large projected increase in households. While the City of Madison's percentage share of households and population is projected to continue to slowly decline, close to 36,000 or 50% of all future new households within the Metropolitan Planning Area are projected to be located within the central city.

Age

Much like the rest of the state, Dane County has a large elderly population that is projected to grow in the future. The percentage of Dane county's population aged 65 and older is expected to double from 10% to 20% between 2010 and 2040. This growth is partially due to the aging of the Baby Boomers generation as well as advances in medicine that have increased life expectancies. The growth of this population cohort comes at a time in which aging in place – living in one's own home and community, independently regardless of age, income, and ability – has become not only an expected consideration but a norm. A growing

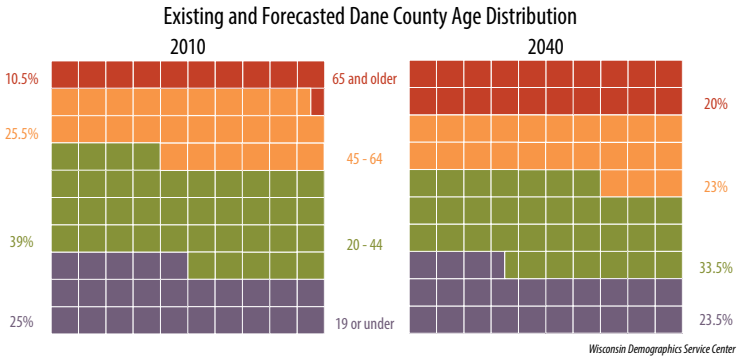


Figure 2-9: Existing and Forecasted Dane County Age Distribution

aging population, some of whom will not have the ability to transport themselves, will require a transportation network that will allow for safe and convenient transportation to grocery stores and other shopping destinations, entertainment, healthcare facilities, places of worship, and other destinations. Existing accommodations will have to be reinforced and future technologies explored to ensure adequate mobility and accessibility for all.



Race and Ethnicity

The United State has become and is projected to continue becoming more diverse. In fact, the Pew Research Center projects that more than 80% of population growth between 2010 and 2050 will be attributable to immigrants and their US-born descendants. This, in combination with higher fertility rates among African American, Hispanic American, and Asian American populations compared to the non-Hispanic white population, is driving the trend of growing diversity.

In the Madison region these trends have been evident as well. Between 2000 and 2010, the white population grew at a rate of 9% while the African American population grew at 49%, Asian American population grew at 56%, mixed races population at 59%, and other minority groups grew at 82%. Further, the Hispanic population grew at a rate of 101% compared to the Non-Hispanic population growth rate of 11%. This is important because of the different travel habits and residence location decisions of the minority versus white population. Of course, these choices may change in the future. See the Environmental Justice Analysis in Appendix B for more detailed information on the distribution of the minority population within the region and an analysis related to the equitable distribution of transportation resources.

Demographics of Dane County, 2010

Race

Race	Number 2010	Percent of Total 2010	Increase 2000 -2010
White	413,631	85%	9%
Black/African American	25,347	5%	49%
Asian	23,035	5%	56%
Other Minority	13,960	3%	82%
Two or More Races	12,100	3%	59%
Total Population	**488,073**	**100%**	**14%**

Ethnicity

Ethnicity	Number 2010	Percent Total 2010	Increase 2000-2010
Hispanic	28,925	6%	101%
Non Hispanic	459,148	94%	11%
Total Population	**488,073**	**100%**	**14%**

Figure 2-10: Demographics of Dane County, 2010

ECONOMICS

The location, density, and distribution of employment in relation to where employees live are some of the primary factors influencing travel demand. Though work trips make up less than 20% of all trips, they are generally the longest trip of the day and most occur during peak use times, driving the capacity needs of the transportation system. Often non-work trips are combined with work trips, contributing to congestion during the peak travel periods.

Dane County is home to the State's flagship university, the seat of state government, and to numerous biotechnology firms. Additionally, the region boasts strong healthcare, health and information technology, agribusiness/food, insurance, financial, and precision manufacturing industries. The regional economy is becoming increasingly private-sector driven. The diversity and concentration of employers within the county has led to the county having one of the lowest unemployment rates in Wisconsin, and being a net importer of employees. Within the County, the cities of Madison and Middleton have more jobs than workers living in the community. According to US Census data estimates, around 40,000 workers travel into Dane County per day from surrounding counties, while around 10,000 travel from Dane County to surrounding counties for work.

In the future, it is anticipated that Dane County will continue to import an increasing number of employees from surrounding counties. Between 2010 and 2050, Dane County's employment is forecast to increase from 314,000 to 398,700, while the

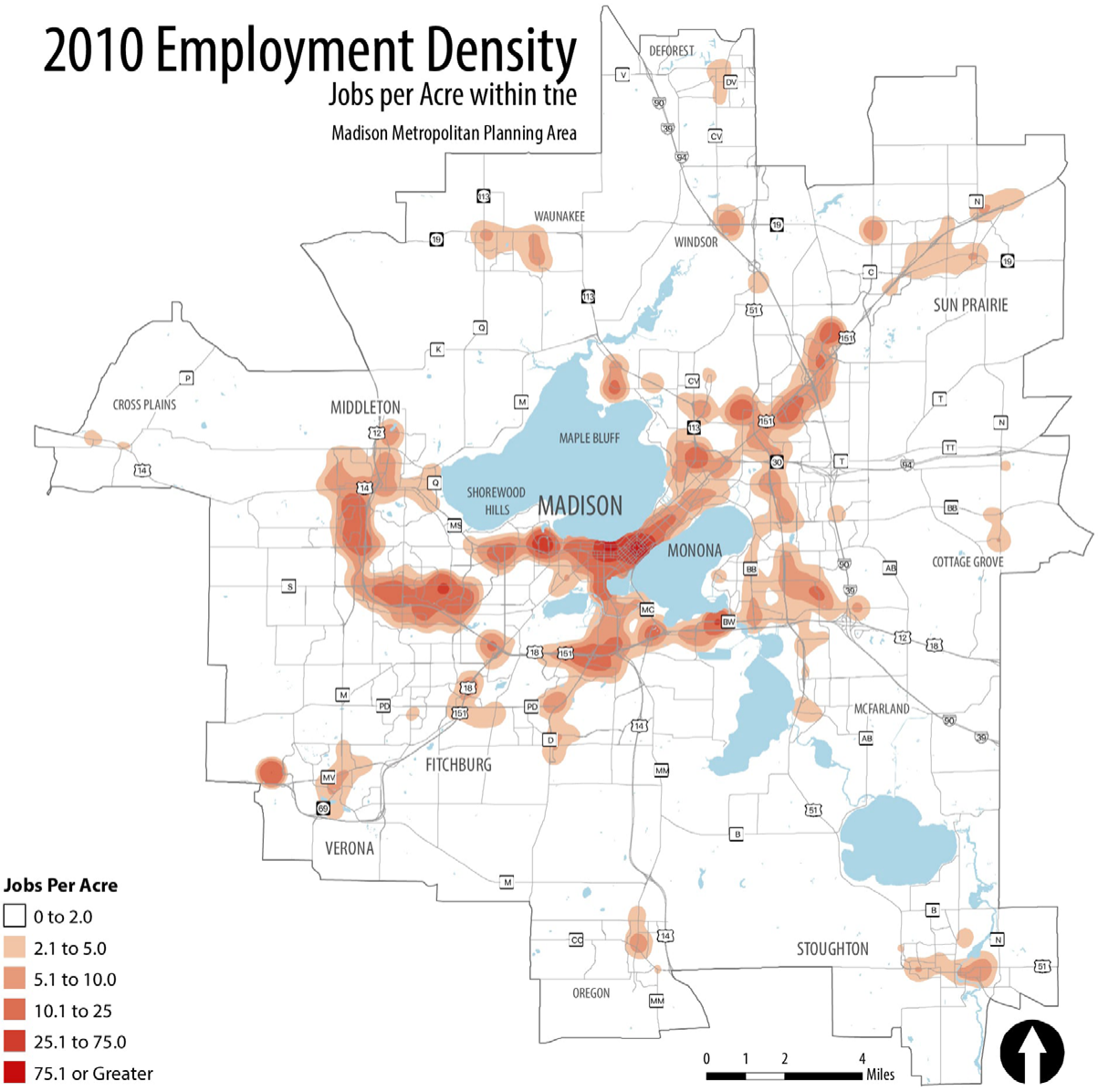


Figure 2-12: 2010 Employment Density

2050 resident employed labor force working in the county is projected to be 316,100. Assuming the percentage of Dane County workers working in other counties remains at 5.3%, the number of workers commuting into the county from other counties would increase to 99,300, a 136% increase from today's numbers.

While the City of Madison's share of employment is forecast to decline somewhat, total employment within the city is projected to grow by 46,000, accounting for over 50% of new employment within the Metropolitan Planning Area. Of that,

Figure 2-13

Madison Metropolitan Area Employment

2010 InfoUSA and 2050 Forecast

Municipality	2010 InfoUSA Employment	2010 InfoUSA % of County	2050 Forecast Employment	2050 Forecast % of County	Change Number	Change Percent
Central Urbanized Area Total	249,579	80%	307,366	77%	57,787	23%
City of Madison	195,888	62%	241,093	60%	45,205	23%
City of Fitchburg	12,165	4%	17,967	5%	5,802	48%
City of Middleton	19,104	6%	22,941	6%	3,837	20%
Village of McFarland	1,943	1%	2,511	1%	568	29%
Larger Outer Urbanized Area Total	45,094	14%	70,545	18%	25,451	56%
City of Sun Prairie	11,362	4%	15,168	4%	3,806	34%
City of Stoughton	6,445	2%	6,625	2%	180	3%
City of Verona	9,315	3%	22,280	6%	12,965	139%
Village of Cottage Grove	2,625	1%	4,287	1%	1,662	63%
Village of Waunakee	5,901	1%	8,406	2%	2,505	42%
Northern (DeForest/Windsor)	6,054	2%	9,737	2%	3,683	61%
Village of Oregon	3,392	1%	4,042	1%	650	19.16%
Smaller USAs Total	9,567	3%	11,267	3%	1,700	18%
Rural Total	9,478	3%	9,480	2%	2	0%
County Total	313,718		398,658		84,940	27%

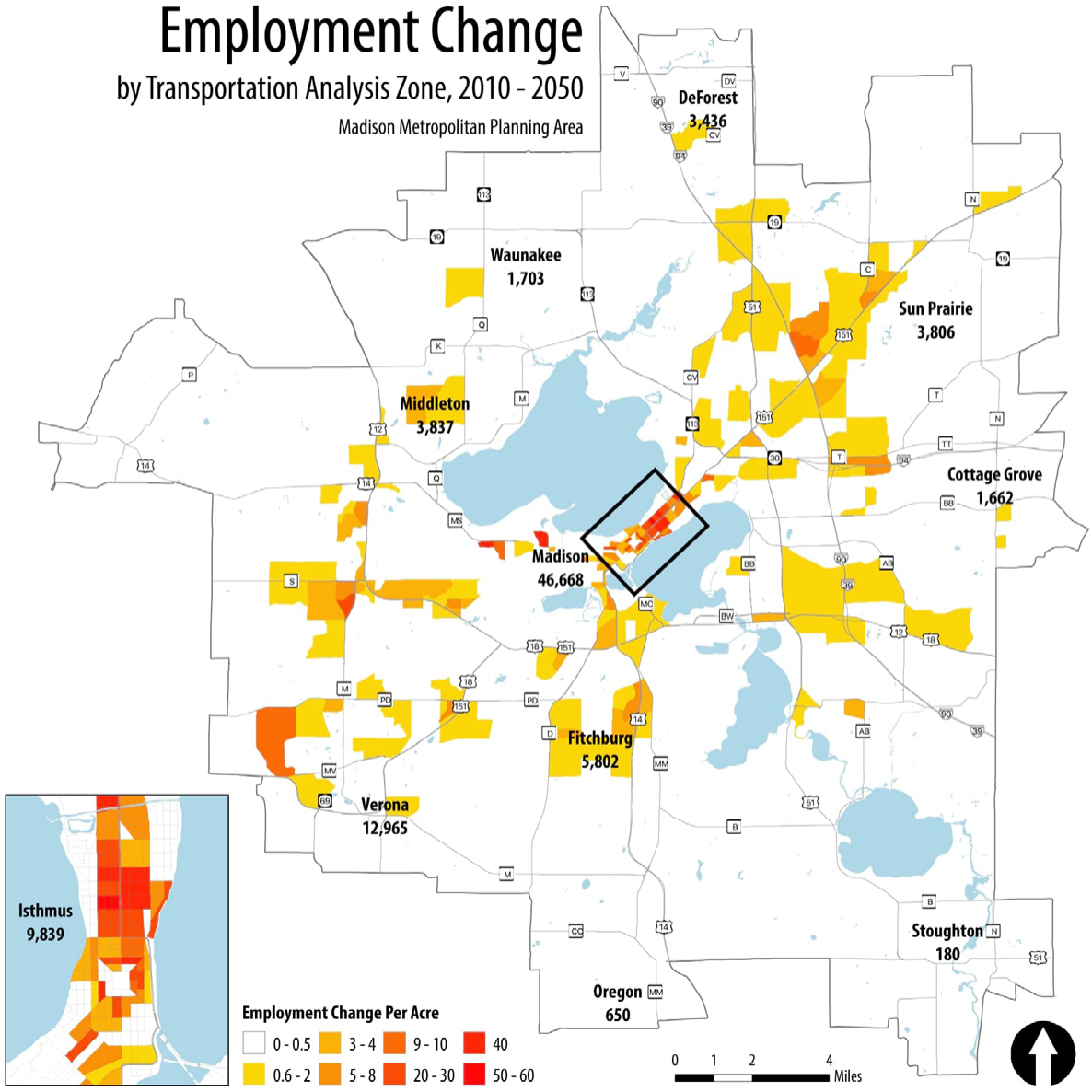
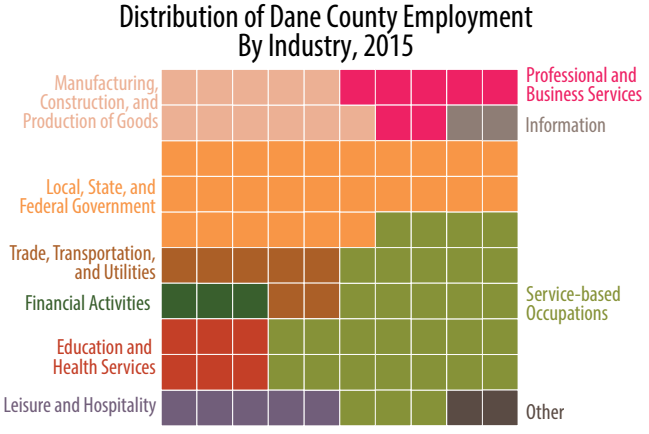


Figure 2-14: Employment Change 2010 - 2050

around 10,000 new jobs are forecast within the Isthmus area. This is largely based on projections for the Capitol East District, developed to assess future parking demand and other necessary improvements. Among suburban communities, the City of Verona's employment is expected to grow by far the most, largely due to Epic Systems, the county's largest private employer. However, Fitchburg, Sun Prairie, Middleton, DeForest, and Cottage Grove are all expected to have a healthy increase in employment.



2015 Annual BLS County-level QCEW Data

Figure 2-15: Distribution of Dane County Employment by Industry, 2015

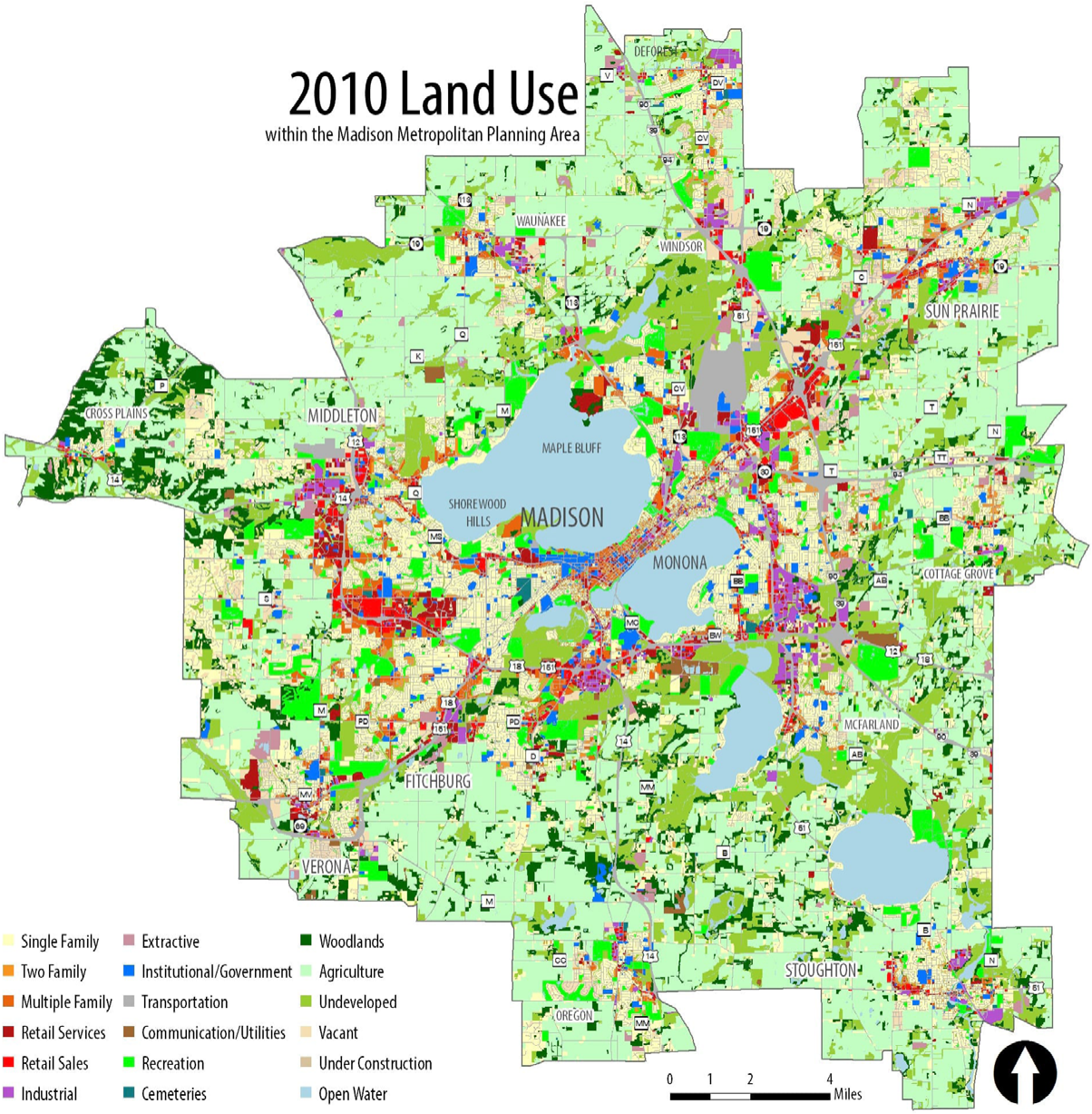


Figure 2-16: 2010 Land Use

LAND USE

The mix, location, and density of land uses determines travel demand. This means that land use and site configuration have a direct impact on the types of transportation facilities and services that are needed in an area. For example, residential land uses must have access to places of employment, stores, schools, and entertainment; therefore, it is imperative that there are roadway, transit, bicycle, and pedestrian connections between land uses. The distance between and density of the land uses influences the type of transportation one may use for a specific trip and whether the trip will be made as an individual trip or in a chain of trips.

Conversely, the availability of transportation facilities may influence whether a development is viable or not. For example, without convenient highway access, large retailers on the urban periphery may not be able to attract customers. Similarly, industrial areas are less likely to succeed without easy access to interstate highways or other major freight corridors. Land use

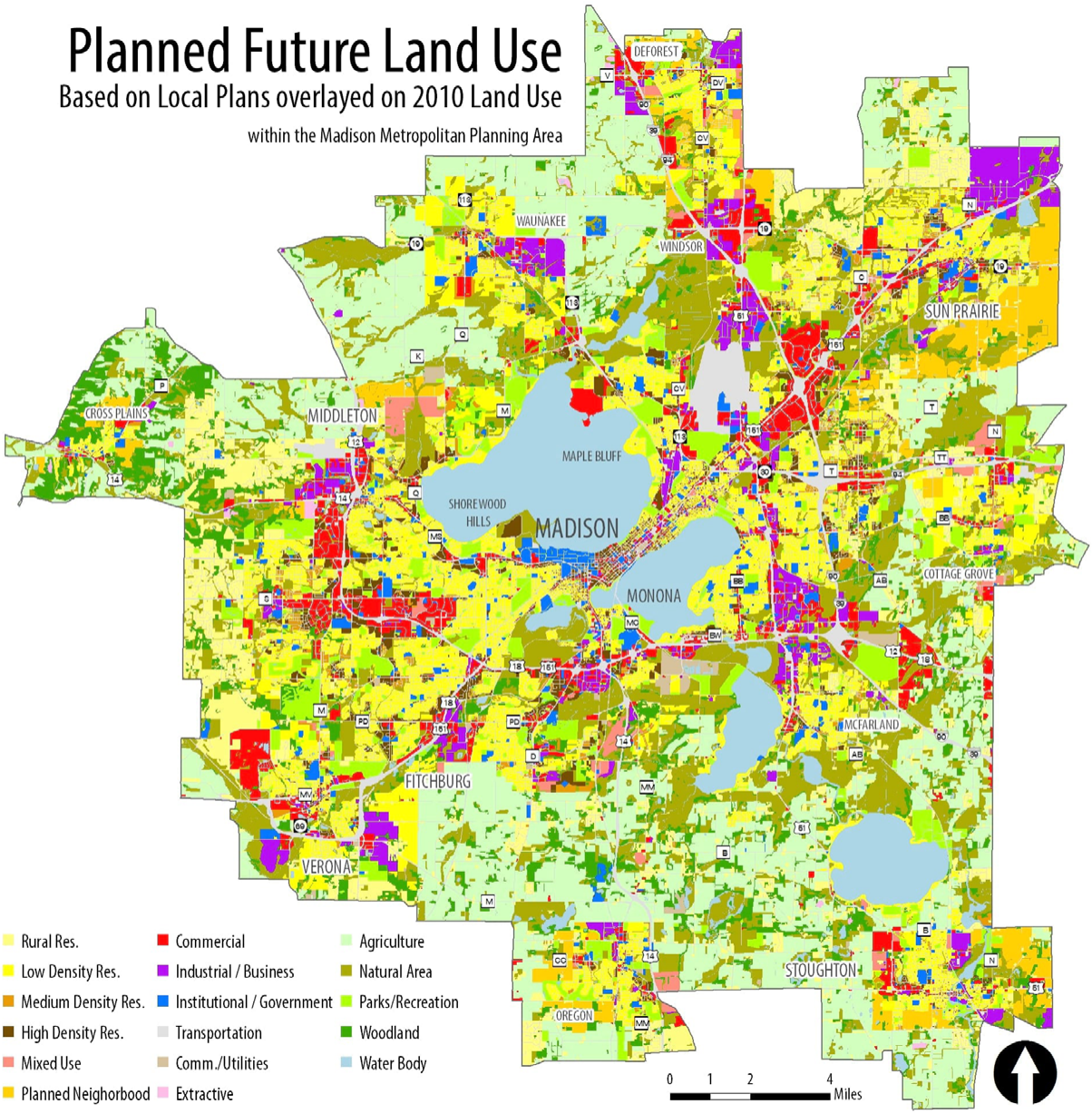


Figure 2-17: Planned Future Land Use

and transportation facilities are inextricably linked.

Figure 2-16 shows the location of existing land uses in the Madison Metropolitan Planning area. Some of the most intense or dense uses include two and multifamily residences, commercial, and institutional/governmental. These uses tend to be concentrated in downtown Madison, the Isthmus, and along major transportation corridors in communities throughout the area. Trip generating uses, such as retail sales/services and industrial uses, agglomerate near one another in areas with strong access to regional or interstate facilities. Less intense uses, such as single family homes, tend to locate within, at a minimum, driving distance to major regional transportation corridors and away from intense or trip generating uses.

A number of urban planning models have been developed to determine how land use, transportation facilities, and density interact. One prominent contemporary model, the Rural-to-Urban Transect, suggests that urbanism occurs in symbiotic

transects. The Transect describes levels of urbanization that range from a natural rural preserve to a dense urban core. Each of these typologies is symbolic of different development patterns and requires different transportation facilities. One of the benefits of this model is that it demonstrates the similarity between zones that may not appear to be similar, but have similar characteristics and require similar transportation treatments.

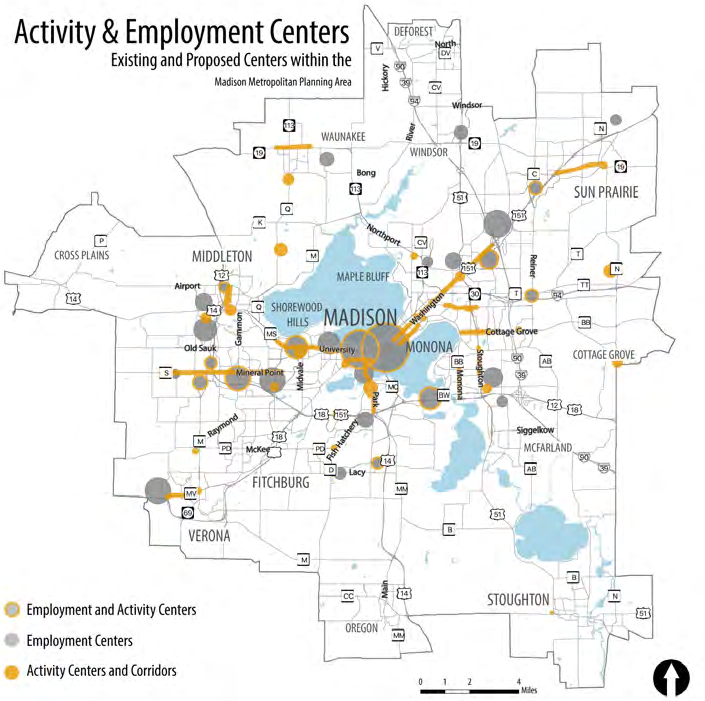


Figure 2-18: Activity and Employment Centers

For instance, the Madison neighborhood of Hill Farms near University Avenue has similar transportation needs to that of the Schenk-Atwood-Starkweather-Yahara (SASY) neighborhood. Though the densest portion of Hill Farms would be viewed a contemporary, transit-oriented development and SASY is an older neighborhood built around a defunct streetcar line, both require high-quality transit service, quality pedestrian and bicycle facilities, and regional transportation for moving residents, workers, shoppers, and freight. The Transect would identify them both as "urban center" zones, and require similar facilities.

In the past, communities did not deviate from the gradient shown in the Transect – an urban core buoyed a community, with urbanity dissipating into suburban and then rural form gradually as one moves away from the core. This configuration encourages driving in the periphery and forces traffic into one dense core. Contemporary configurations retrofit dense activity centers into areas that have been traditionally home to suburban or general urban development or build them as part of new developments. This configuration change increases pedestrian and bicycle activity, while making transit more viable. The development of high-density, mixed-use activity centers, primarily along existing and planned major transit corridors is a central recommendation of the City of Madison's Madison in Motion Transportation Plan and this RTP. The development of these centers, illustrated in Figure 2-18, is reflected in the land use growth forecast for the RTP.

Figure 2-17 on page 2-10 shows planned future land use based on local land use plans. The map, along with input from local planners and officials, served as a guide for the growth forecasts used to estimate future travel demand for the RTP using the regional travel model. It should be noted that the growth forecast for the RTP constituted far less than the complete build out of plans reflected in the map due to differences in the timeframe of local plans, and the need for the RTP growth scenario to adhere to county forecast control totals for households, population, and employment.

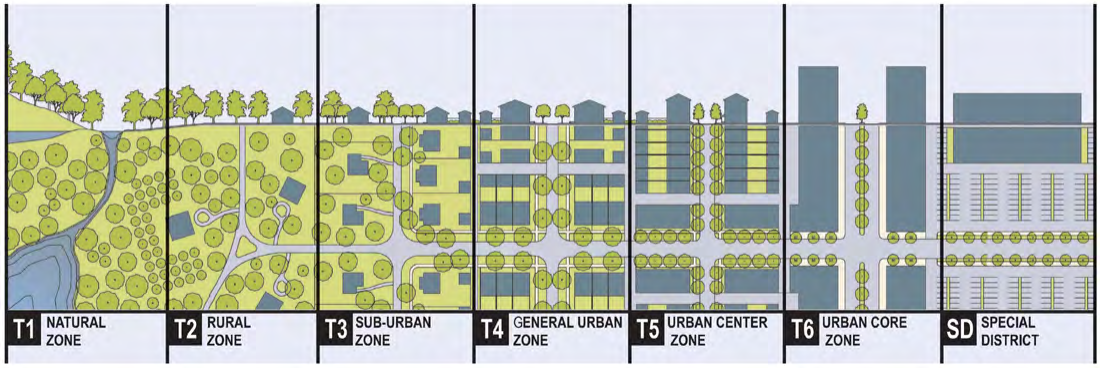
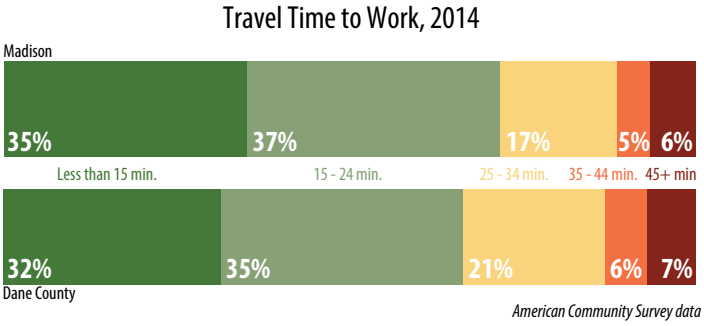


Figure 2-19: Rural to Urban Transect

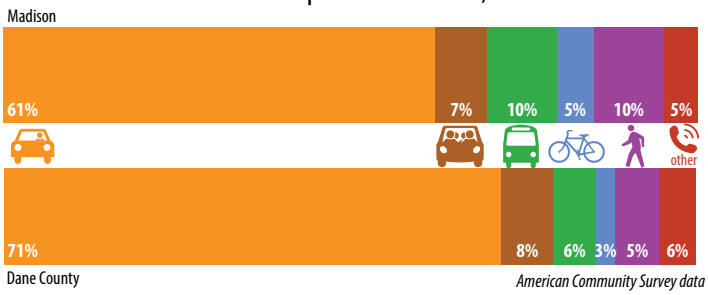
COMMUTING PATTERNS

Commuting describes travel that is made to and from a place of employment. In the Madison area, the most dense concentration of employment is in the downtown Madison/UW Campus area; however, over the last few decades most of the new employment growth has occurred in peripheral Madison and suburban job centers, such as the American Center, Old Sauk Trails, UW Research Park, Middleton Business Park, Fitchburg Center, and Epic campus. As a result, travel patterns are becoming more disbursed throughout the region.



American Community Survey data

Figure 2-20: Travel Time to Work, 2014



American Community Survey data

Figure 2-21: Mode of Transportation to Work, 2014

The mode and time it takes for someone to get to work are directly related to where people live. People who live in urban environments generally have shorter commutes than their rural counterparts and more modal options available for their commute. In Dane County, 71% of all residents drive alone to get to work, compared to 61% in the City of Madison. City residents were also more likely to take transit, walk, and bike to work. County residents were more likely to carpool to work or utilize other commuting methods, such as telecommuting.

Over the last five years, a number of new apartment buildings have been constructed in downtown Madison and on the Isthmus. These new buildings have attracted a residential population of young professionals. While many of these new residents may be moving to downtown to be closer to work, others are doing so in an effort to live a more urban lifestyle while working in the periphery of the region. This results in so called "reverse commuting."

One particularly popular reverse commute is between downtown Madison and the Epic campus on the western edge of the City of Verona. In 2012, Epic employed more than 6,200 employees. Understanding that many Epic employees were commuting from Madison to Verona, Metro Transit, the City of Verona, and Epic worked to add two new bus routes – one connecting the campus to downtown Madison and the other connecting to the West Transfer point. Ridership has been so strong on the routes that buses were added in 2015. As of 2015, Epic had grown to more than 9,000 employees.

As mentioned previously, Dane County is a net importer of workers due to having a surplus of jobs and stronger economy than surrounding counties. Figure 2-21 on page 2-13 shows county-to-county average daily commuter flows based on 2009 - 2013 American Community Survey data. The counties supplying Dane County with the most workers per day (all over 4,000) include



The large Epic Systems corporate campus in western Verona.

Columbia, Rock, Green, Jefferson, and Sauk. More than 1,000 workers per day leave Dane County for work in each of the following counties: Rock, Columbia, Sauk, and Jefferson Counties.

As the major employment hub, the City of Madison experiences a large influx of workers from other communities within the county as well as from outside the county. It is estimated that about 63,000 workers commuted to the city from other communities in Dane County in 2014. Figure 2-23 shows the percentage of residents within each community that are commuting to the City of Madison for work. Incorporated communities with the most workers commuting to Madison were some of its closest neighbors, including the Village of Shorewood Hills (68%), Village of Maple Bluff (62%), Town of Madison (60%), City of Fitchburg (58%), City of Monona (54%), and Village of Brooklyn (51%). Many unincorporated towns had more than 45% of all workers commuting to the City of Madison including the Towns of Dane, Vermont, Vienna, Bristol, Cottage Grove, Madison, Blooming Grove, and Middleton.

One way that the region mitigates the traffic impact of regional commuting is the Wisconsin Department of Administration (DOA) run State of Wisconsin Vanpool Program. The Vanpool Program allows groups of 8 to 15 commuters from various parts of southern Wisconsin ride to work each day together. Vanpools are more formally structured than carpools, due to the cost of operating and insuring the vans. DOA provides this structure, collecting a biweekly fee from all van riders to cover gasoline, vehicle maintenance, and insurance for all participants. Emergency guaranteed rides home are provided through MATPB's Rideshare etc. program up to three times per year.

There are currently over 900 riders utilizing 80 vans originating in communities all across southern Wisconsin. Some vanpool participants come from communities as close to Madison as McFarland, while others travel as far away as Milwaukee and Racine. Some of the more popular vanpools origins include Janesville, Milwaukee, Waukesha, and Portage.

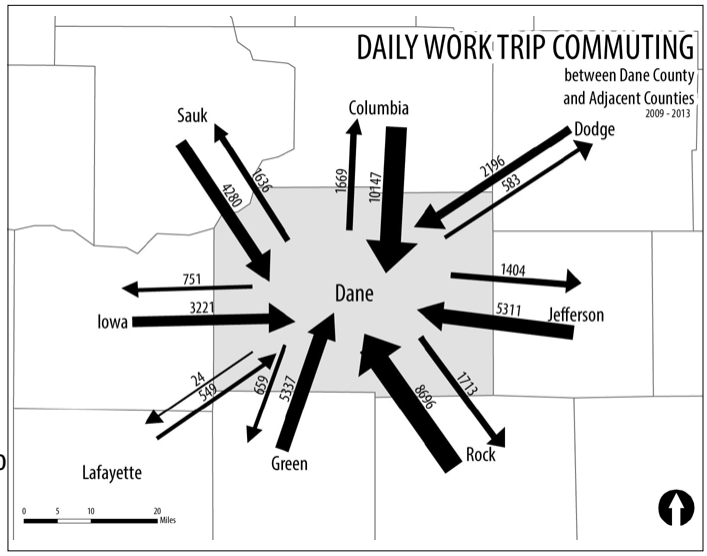


Figure 2-22: Daily Work Trip Commuting between Dane and Adjacent Counties

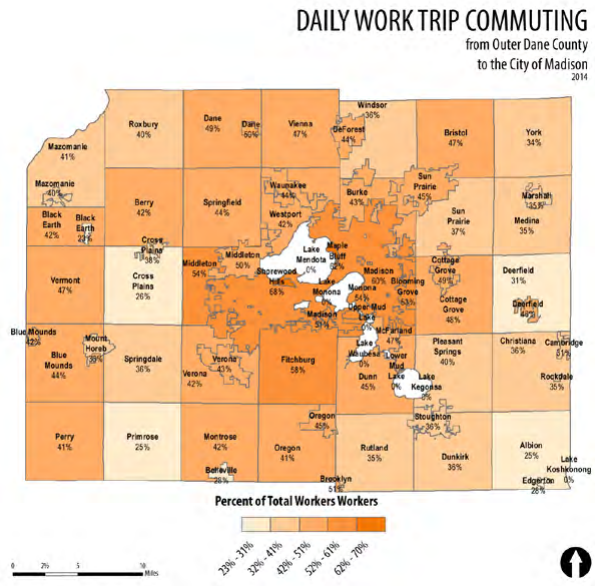


Figure 2-23: Daily Work Trip Commuting from Dane County to the City of Madison

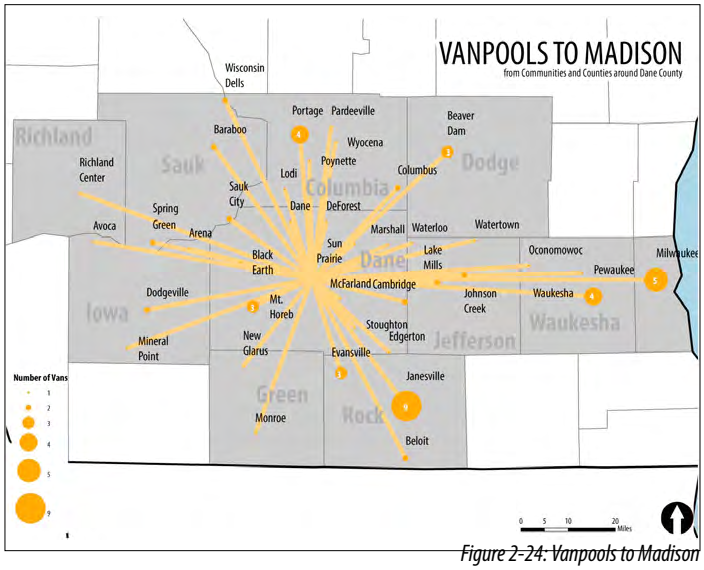


Figure 2-24: Vanpools to Madison

EMERGING TECHNOLOGIES

Transportation is currently experiencing a rapid change not seen since the early 20th century. Some of this change is due to changes in personal preferences, such as the increase in freight going directly to home due to the rise of online shopping, while other changes are due to the advent of new technologies. In the 2015 report Transportation Technology Scan: A Look-Ahead, the US DOT identified 11 technological advances and innovative concepts that could fundamentally alter the transportation landscape and their potential benefits, challenges, and potential issues. These technologies include:

Additive manufacturing (3D printing) is a technology that allows for three-dimensional objects to be created using an extruder or laser layer by layer. This technology has the potential to upend the manufacturing process by replacing the transfer of parts with the transfer of designs over the internet, allowing parts to be printed on-site. This could reduce the need for warehouses and shipping services – lessening the number of heavy vehicles on roadways.

- Benefits of this technology include more localized production of goods, reducing regional roadway infrastructure needs – some of the most expensive roadways in the transportation system. This may reduce the cost of low-volume vehicle parts, including the cost of transit vehicle replacement parts and allow for the purchase of hard to find/procure parts.
- Potential downsides with this technology include an increased need for high-quality local infrastructure due to the nature of more goods being produced locally.

Advanced analytics and machine learning are technologies that provide computers with the ability to learn without explicitly being programmed, particularly when being inputted with "big data."

- Example programs are being created with the capability of using big data to identify patterns that can be used to make well-informed predictions such as traffic models. Some traffic operations centers have automated traffic operations systems that automatically adapt signalization during periods of high traffic or alert operators of potential traffic accidents. An adaptive signal system was installed in the McKee Road and Fish Hatchery Road corridors as part of the Beltline/Verona Road construction project and a similar system is planned for the University Avenue corridor.
- Benefits include increased efficiency of existing roadways through predictive analytics and pre-trip guidance for travelers and increased safety due to automatic dispatching of 911 services through a mixture of this technology and the "internet of things."

Automated vehicles are vehicles in which at least some aspect of safety-critical control functions occurs without driver input. Over time, it is anticipated that vehicles will gradually gain more autonomy. Because of this continuum of automation, "levels of vehicle automation" have been developed to quantify levels of driver reliance. A vehicle with a rating of 0 has no automation and requires the driver to manage all control functions, while a rating of 5 is completely automated and requires not human management during the trip.

- Examples of vehicle automation are becoming more mainstream each year. Many higher-end vehicles

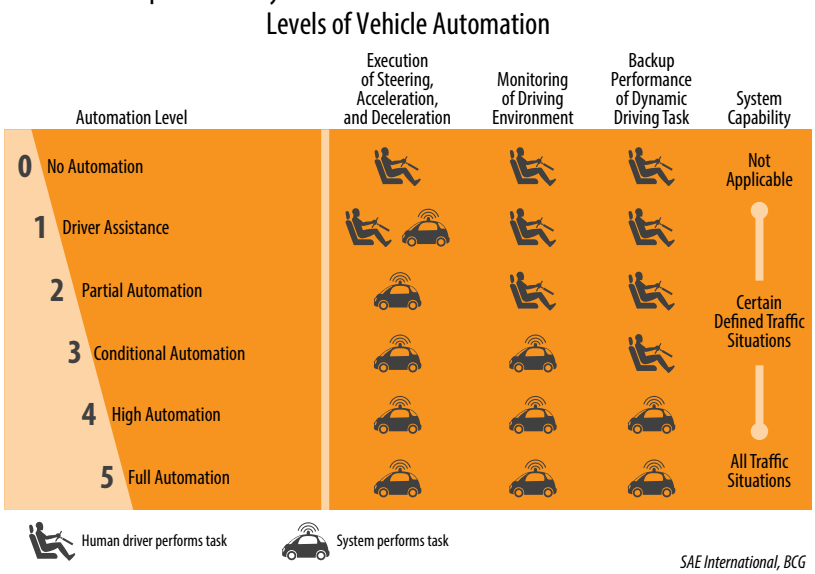


Figure 2-25: Levels of Vehicle Automation

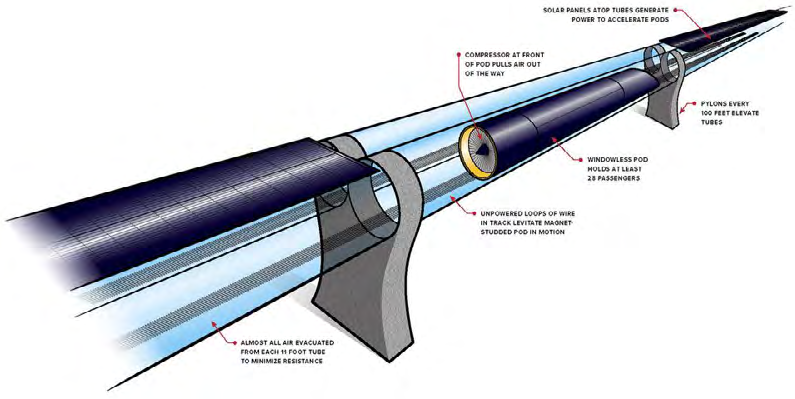


currently come with automated features such as parking assist and crash avoidance. Some automakers, such as Tesla, have released highway autopilot features or are planning on releasing them in the near future.

- Benefits of this technology include improved safety, reduced travel times, reduced energy consumption, reduced vehicle emissions, improved reliability, increased roadway capacity (due to closer vehicle spacing), and increased transit accessibility. Vehicle sharing could become much more attractive since they would be able to provide door-to-door service for all riders. Work zone safety would be greatly improved. Transit service could be delivered at a reasonable cost in lower-density communities.
- Potential Issues of this technology include a dramatic increase in vehicle miles traveled due to "drivers" that would otherwise be unable to use the roadway. A reduction in driving stress may lead to an increase in discretionary travel and increased urban sprawl. The transition period from traditional cars to autonomous vehicles may be difficult due to low public acceptance of the vehicles and cost barriers for low-income or elderly traveler. Further, the unknowns of this technology make it difficult to determine whether capacity expansion is an appropriate treatment for congested or unreliable roadways. Parking lots and related facilities could be rendered obsolete because vehicles will have the ability to drop off passengers and return to their origin or pick up other passengers.

Hyperloop is an intercity travel concept in which patrons travel on a fixed route of paired bi-directional tubes on elevated pylons, traveling in capsules riding on low-friction air bearings within those tubes at speeds of up to 750 miles per hour.

- Benefits of this technology include the ability to reach far away destinations in a fraction of the time it would take to use conventional options – such as regional buses or airplanes. The technology could lead to economic



Hyperloop concept, CNET.com

development benefits for regions and cities it serves. It has the potential to save a great deal of energy, emissions, and time over existing transportation modes.


Advanced robotic inspection equipment—the "concrete crawler"—in a demonstration at the New York Power Authority's Niagara Hydroelectric Power Plant.

US DOT

Infrastructure inspection robots can be used to assess the structural integrity of a variety of infrastructure using sensors and 3D imaging.

- Benefits of this technology include the ability for governmental agencies to examine and assess more infrastructure due to the speed of robots in comparison to humans; improved and more comprehensive inspections that result in improved reliability, safety, and infrastructure longevity; better assessment of infrastructure at disaster sites; and a reduction in inspection-related traffic disruptions.

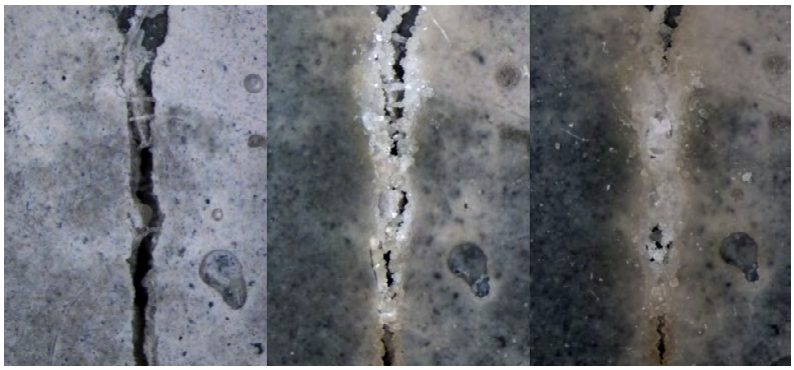
Innovative concepts for protecting pedestrians, bicyclists, and motorcyclists are improvements in traffic safety for "vulnerable road users." These improvements range from vehicle safety mechanisms such as sensor-based detection systems to pedestrian guards on freight trucks.

- Examples of this type of technology include advanced driver assistance systems (ADAD) that alert drivers of objects or people nearby using radar, sonar, or infrared signals; technologies that apply breaks to avoid crashes; and technologies that avoid collisions by cooperative communication between cell-phone signals of vulnerable users and vehicles to notify both parties of potential issues.
- Benefits of this technology include increased safety for all roadway users. Additionally, this could lead to an increase in multimodal activity (and thus lower VMT) due to increased confidence in safety by vulnerable users.

The **Internet of Things** is the network of interconnected, uniquely identifiable devices embedded in physical objects or "things."

- Examples of this technology include applications that monitor and control energy use, cloud-connected wearable devices that track physical conditions, and vehicle-to-infrastructure technology that is currently in development.
- Benefits of this technology include a better understanding of infrastructure utilization (more accurate tracking of usage patterns), safety improvements (tracking mental alertness for professional transportation operators and real-time monitoring of environmental hazards), and improved operations for freight (robotic loading and unloading) .

Materials science in infrastructure is technological advancements in the materials used to produce and repair physical infrastructures, such as roads and bridges. New materials such as self-healing roads have been shown to extend asphalt life by more than 50%. These pavements work by mixing organic matter into the pavement to produce limestone or other filling materials when exposed to water and heat, filling and seal cracks as they occur.



Bioconcrete though the healing process. Delft University.

- Benefits of this technology include increasing the lifespan, resilience, and safety of infrastructure while reducing maintenance needs, costs and environmental impact. Increased roadway lifespan will reduce traffic disruptions caused by roadway reconditioning and reconstruction. Improved roadway conditions will reduce driver and cyclist maintenance cost and improve the quality of travel. Reductions in road repair need will reduce CO_2 emissions from cement production and construction.
- Potential challenges associated with this technology include a need to train workers in new construction and maintenance techniques.

On-demand ride services (sometimes called ridesharing or transportation network companies) are services that use smartphone applications to connect passengers to drivers. In many ways this is not very different than traditional taxi service; however, the increased price transparency and availability of travel information (such as arrival times and GPS locations) have caused these services to increase in popularity.



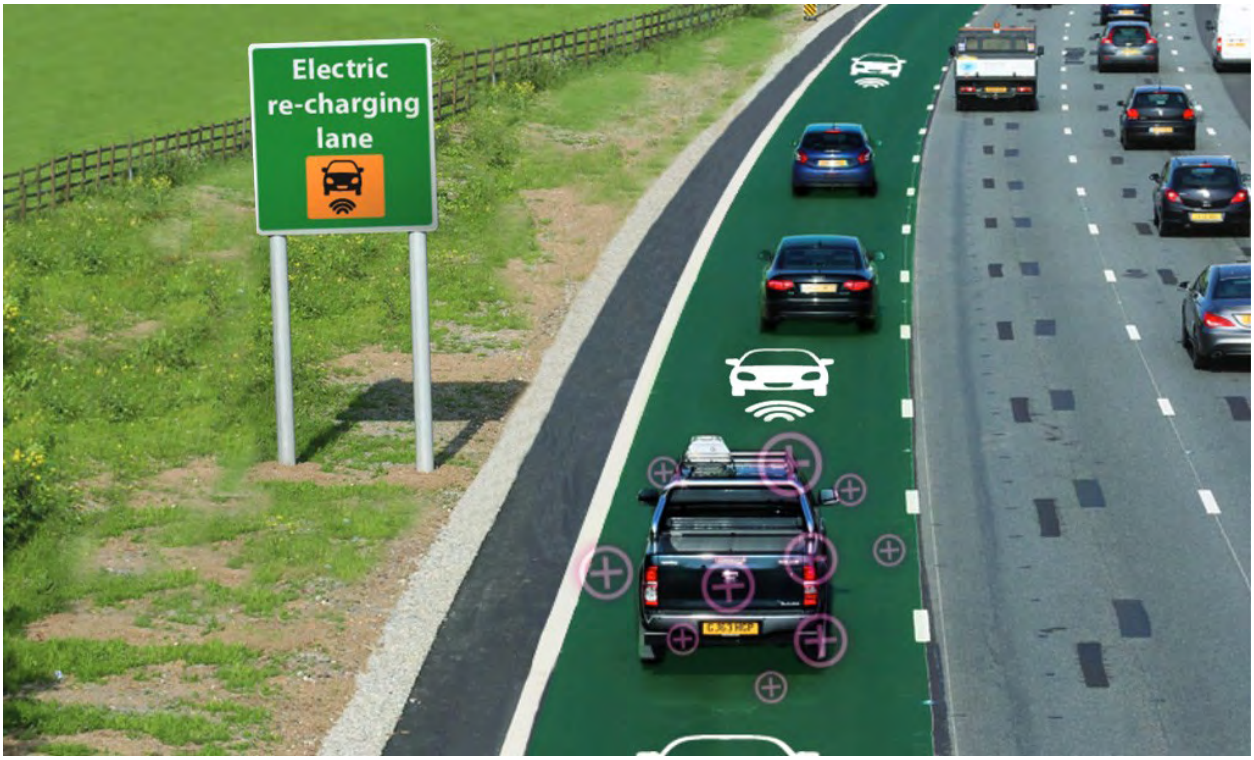
Self-Driving Uber in Pittsburgh, PA. Businessinsider.com

- Examples of this type of service include Lyft and Uber. Local services, such as Green Cab, also utilize similar functionality.
- Benefits of this technology include encouraging multimodal travel by making it possible to move away from automobile ownership when combined with other transportation options such as walking, bike sharing, and transit. If applied to transit, the technology could help agencies discover new fixed-routes that may not have otherwise been apparent and also address "first mile, last mile" connection problems. This technology could improve acceptance of autonomous vehicles by increasing the availability of automated vehicles and lowering entrance costs by allowing rental.
- Issues with this type of service include displacement of transit trips and/or active transportation trips if the services are too inexpensive or convenient, resulting in increased VMT and negative environmental impacts.

Unmanned aircraft systems (UAS) (also commonly called drones or unmanned aerial vehicles (UAV)) are aircraft without a human pilot aboard. While these vehicles are currently controlled by operators on the ground, future vehicles will have the ability to operate without a human operator. In fact, the US DOT estimated that the total number of UAS in operation could surpass the number of manned aircraft by 2035.


Delivery Drone Concept, Amazon.com

- This technology is currently used in military situations, law enforcement, firefighting, border patrol, disaster release, search and rescue, construction management, transportation facility inspection, and roadway condition inspection.
- Benefits of this technology include "find and deliver" capabilities that could find people or objects that are lost, reduction of roadway congestion due to drone-based package delivery, increased speed of package delivery, and the ability to solve first-and-last mile freight issues in congested urban environments.
- Potential challenges include reduced quality-of-life due to noise and visual intrusion, safety concerns due to recreational drones, and privacy concerns.



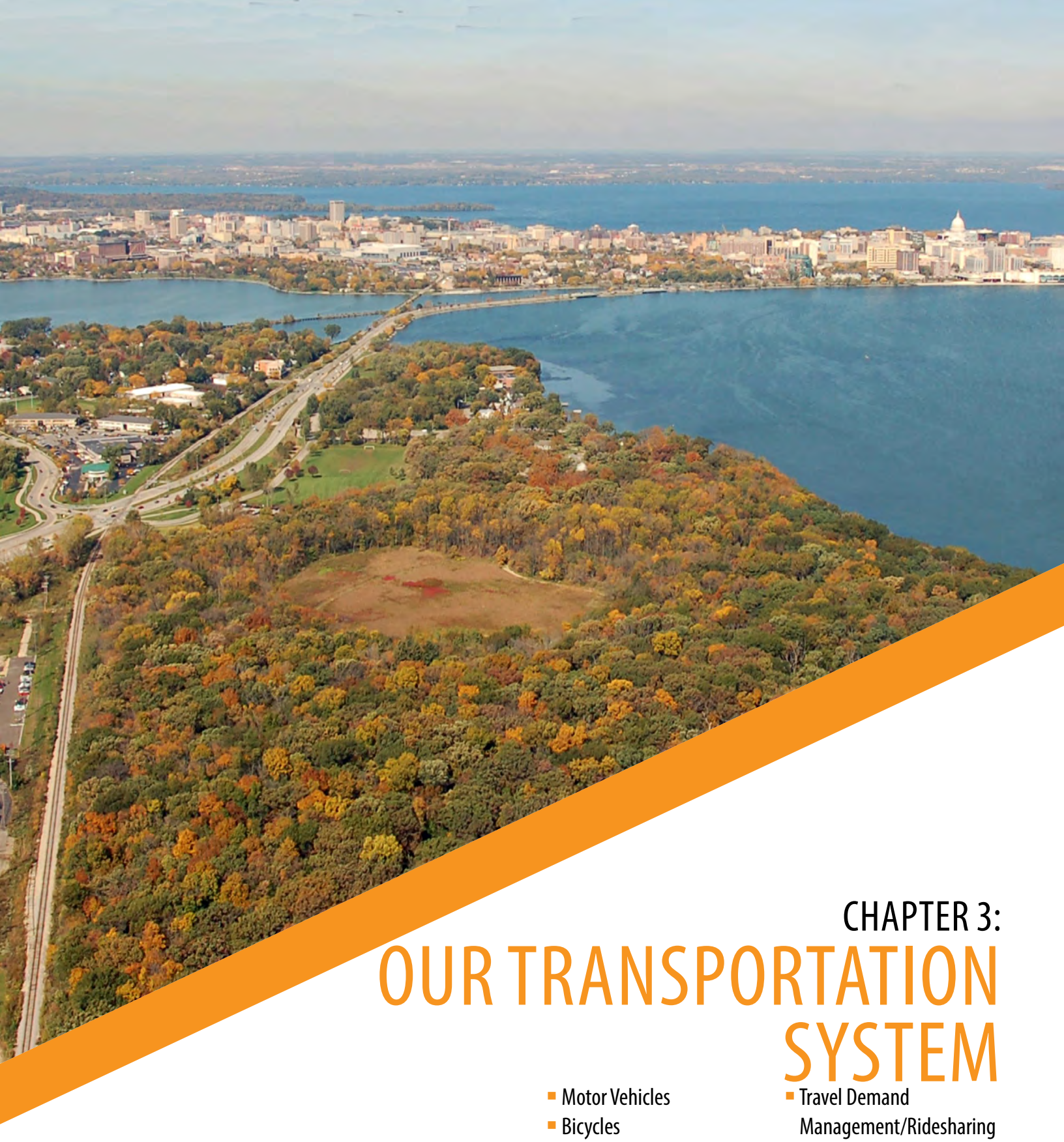
Wireless charging Concept, Intel Corporation

Wireless power transfer is a technology that allows for the recharging of electronic devices with chargers and cables. Initially, it is likely that electric buses and other vehicles traveling on high traffic corridors could be the first adopters of this technology to justify the capital investment cost. Once the technology becomes less expensive, light-duty and consumer vehicles are likely to follow. In addition to wireless power transfer, distributed fast charging has the potential to change the entire transit system. Developers of this technology claim that electric powered buses can be charged in as little as five minutes. This could allow for charging at places where transit vehicles taxi throughout the area, such as the Capitol Square and at transfer points.

- This technology is currently being used with some smartphones and has been used in pilot projects by transit providers in Utah, Texas, and Calfornia.[2]
- Benefits of this technology include limiting the need for individual consumers to have reliable access to charging stations. It would also extend the driving range of electric vehicles by providing charging capability on major roadways, a potential boon for automated vehicles. The technology also allows vehicles to have smaller batteries – reducing weight and improving efficiency. Further, the environmental benefits would be substantial. Smaller batteries reduce the environmental impact of electric vehicle batteries cannot currently be discarded in an environmentally cost-neutral way.

While many of these technologies on their own would be transformational, the confluence of a number of them into the transportation system at once poses more questions than answers for manufacturers, consumers, and planners. It will be important to determine quantifiable ways that the new technologies will impact planning – be it newfound capacity, cost savings, or a complete reimagining of the transportation system. It will be important, now more than ever, to recalibrate planning efforts based on these, and other, emerging technologies and remain flexible, nimble, and adaptable in the coming years.

[2] http://wave-ipt.com/projects



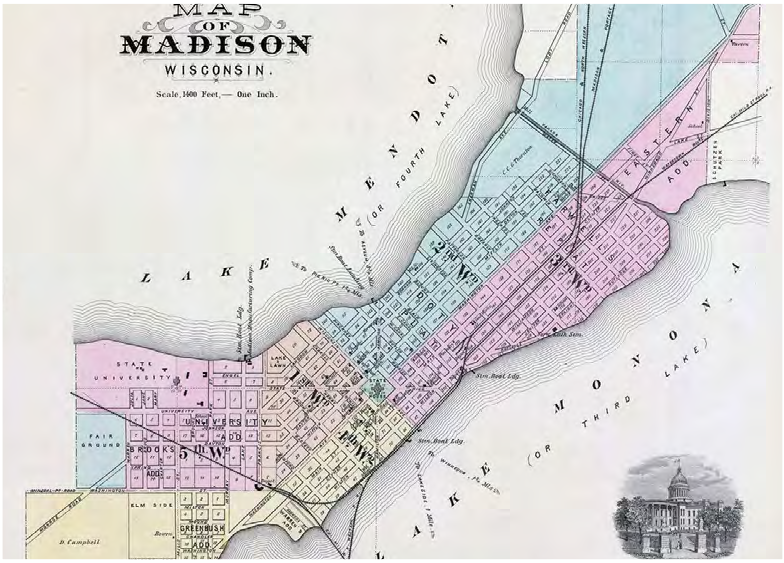
CHAPTER 3:
OUR TRANSPORTATION SYSTEM

- Motor Vehicles
- Bicycles
- Pedestrians
- Public Transit
- Travel Demand Management/Ridesharing
- Inter-Regional Travel
- Freight/Goods Movement

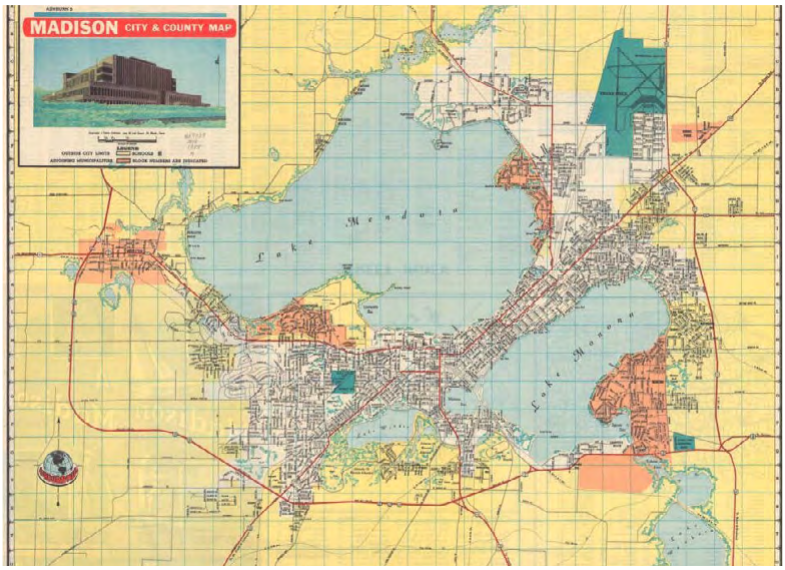
MOTOR VEHICLES

Introduction

Streets and highways form the foundation of the transportation system. They are used by and must be designed to accommodate safe, convenient travel by buses, bicyclists, and pedestrians, as well as motorists. There are over 2,800 miles of public roadways in the Madison Metropolitan Area and close to 550 bridges. Roads are critical to virtually all freight moving to and from locations in Dane County. 98% of Dane County's freight tonnage and 92% of its freight value moves exclusively by truck. The remainder, which moves by other modes for part of its trip, needs to travel by truck on the first or last legs of its journey. Countywide, the roadway system carries an estimated 13.6 million vehicle miles of travel each day. Roadways also have both direct and indirect impacts on the natural environment that must be considered in planning efforts and facility design.



Madison, 1878 Credit DaveRumsey.com.



Madison, 1950s after the construction of the Beltline. Credit University of Texas at Austin University of Texas Libraries

Streets and highways provide connectivity to jobs, homes, shops, parks, and other opportunities. The physical design characteristics of each roadway play a significant role in its safety, operational performance, and accommodation of different transportation modes. As an infrastructure asset, the roadway system requires maintenance to remain in acceptable condition.

The Madison area has a uniquely constrained roadway system due to the natural geography of the area, with the City of Madison's downtown sitting on an isthmus. The City of Madison, founded in 1848, is a master planned community built on a tight grid of streets around what we now know as the Capitol Square. High volume arterial streets radiate from the square and connect to a number of State and Interstate Highways including the Beltline (US Highways 12, 14, 18, and 151), Stoughton Road (US Highway 51), and I-39/90/94. Unlike many urban areas, downtown Madison is located off the freeway and expressway network. This has greatly contributed to the livability of the downtown, but also made traffic circulation more challenging, increasing the importance of travel demand management and operational strategies for mitigating congestion. Many suburban communities surrounding Madison were founded in the late 1800s, and contain a similarly dense street grid in their historic cores.

Roadway development patterns changed across the United States after World War II. America built most of its early highway and freeway infrastructure during this time, leading to the rise of suburbanization. Terms like roadway hierarchy became part of the planning lexicon, and curvilinear streets and cul-de-sacs became the norm for new neighborhood design. The Madison area was no exception to national trends. The construction of the Beltline Highway facilitated growth in areas further from the urban core, including the suburbs. Conceived and approved in 1944, the Beltline opened as a 2-lane highway in 1949.

In the 1950s, intersections with the Beltline were steadily converted into interchanges and portions of the road widened to four lanes. In the 1970s, portions of the roadway were expanded to six lanes. Currently, WisDOT is studying the roadway to determine ways to further improve the efficiency, reliability, and safety of this highly traveled freeway, which provides the only east-west connection south of the urban core between the Interstate and the west side.

The region is facing a number of challenges related to the roadway network. Limited options exist for increasing vehicular capacity through the isthmus, with no possibilities for adding general purpose travel lanes. There are also limited options for enhancing the connectivity of the street network in areas developed in the postwar period. One potential opportunity currently being studied is the addition of one or more non-interchange crossings of the Beltline. However, arterial roadway network congestion is still, with the exception of the Beltline, generally reliable and occurs over a short duration.

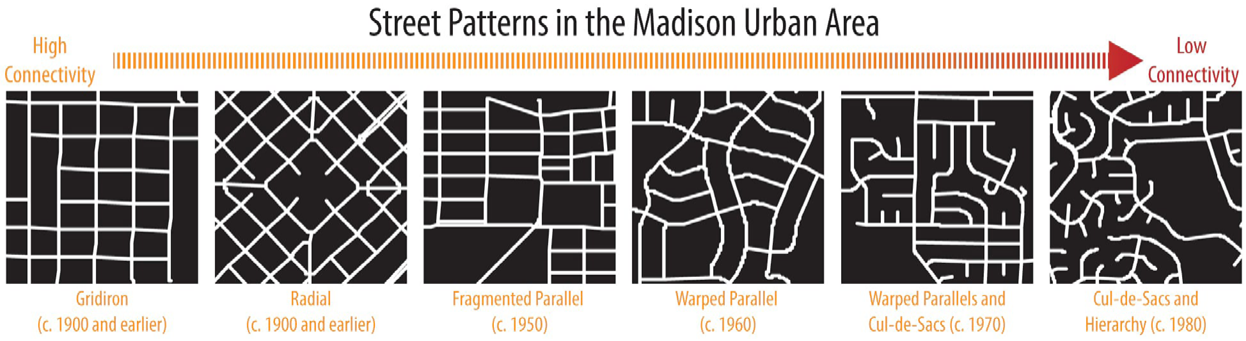
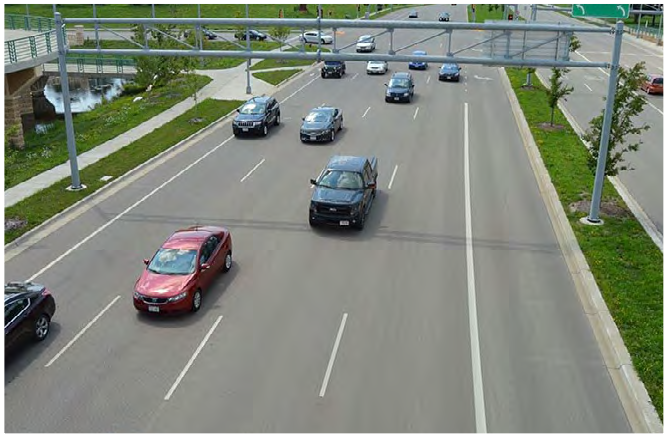


Figure 3-1: Street Patterns in the Madison Urban Area

Roadway Functional Classification System

The Federal-Aid Highway Act of 1973 requires the use of functional highway classification to update and modify the Federal-aid highway system, which includes all regionally significant roadways eligible for federal funding. The functional classification system categorizes highways, roads and streets by the character of service they provide for transportation planning and funding purposes. It defines the role roadways play (mobility, connectivity, accessibility) in serving travel needs and carries expectations about roadway design, including speed, capacity, and relationship to existing and future land use. MATPB and other transportation agencies describe roadway system performance, benchmarks, and targets by functional classification.



Mineral Point Road is an example of an urban principal arterial.

The functional classification system divides roadways into two groups – urban and rural – based upon whether the roadway is located within an urban area. The urban area is defined by the U.S. Census Bureau, and is based upon total population, population density, and large impervious

areas where there is urban non-residential development. The roadway functional classification system makes a distinction between urban and rural roadways because of their differing road network densities and travel patterns.

MATPB coordinates with WisDOT to assign functional classifications to roadways in the urban area, while WisDOT assigns functional classes to roadways in the rural area. Roadways in rural areas must meet certain criteria to be entered into the functional classification system. They must adequately serve the needs of the area population and land uses, be a minimum distance from other classified parallel routes, and must meet several supplemental criteria as well. Roadways within urban areas must meet criteria from these same categories. In addition, the functional classification of roads that cross the urban-rural boundary is generally maintained, to ensure route connectivity.

Figure 3-2, shows the functionally classified roadway system in Dane County as approved in 2015. The map is updated every ten years.

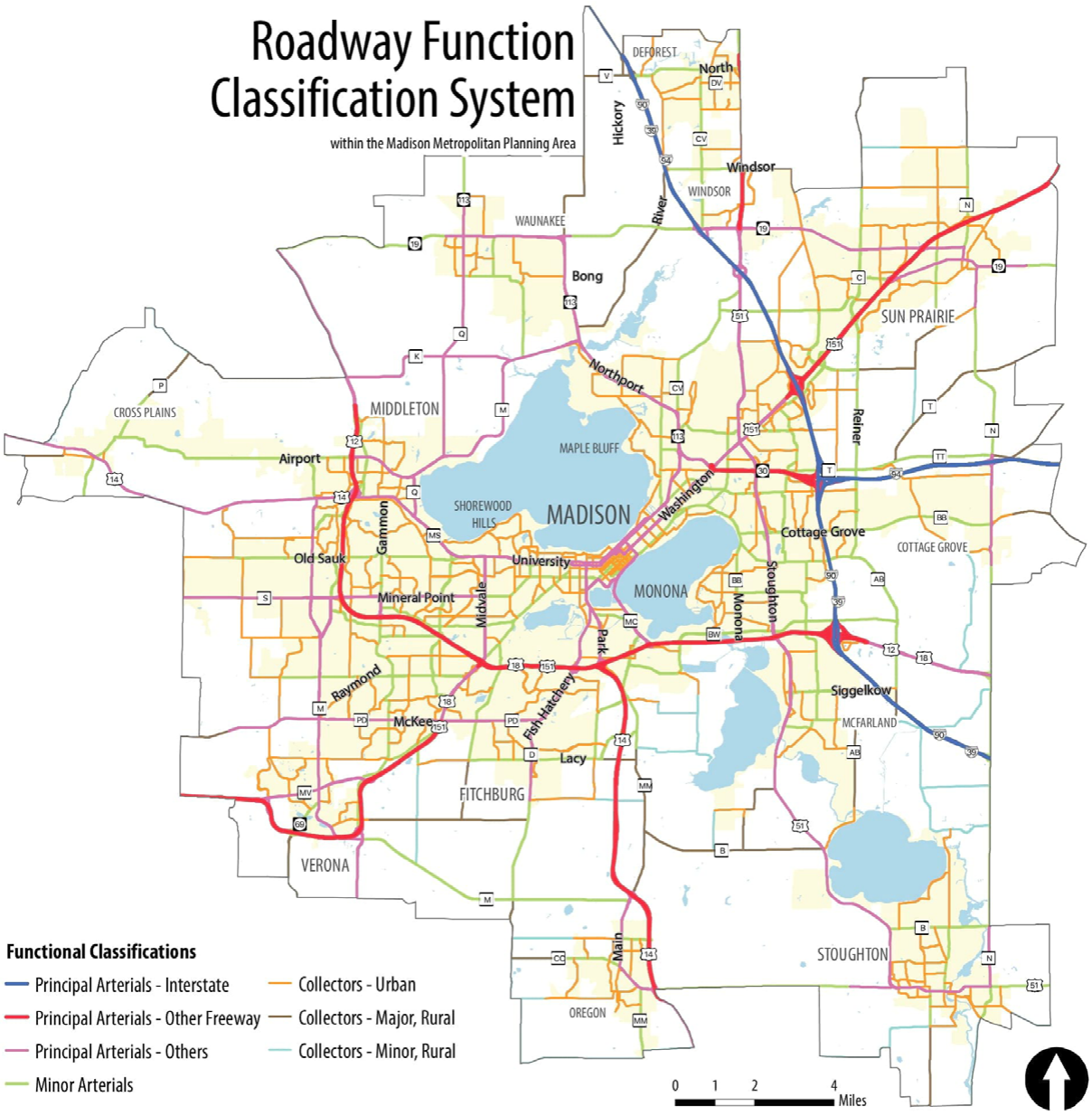


Figure 3-2: Roadway Functional Classification System

Figure 3-3

The Relationship between Functional Classification, Land Uses Served, and Traffic Volumes

Functional Class	Function	Land Use	Volume	Facility Type
Principal Arterials --Interstate	Link major urban areas of the United States. Move inter- and intra regional traffic, particularly long trips in the high traffic volume corridors.	Abutting land uses not directly served. Access and egress points are served by on-and off-ramps.	35,000 to 130,000+	High speed, divided highway with full control of access and grade separated interchanges.
Principal Arterials -Other Freeways	Move inter- and intra regional traffic, particularly long trips in the high traffic volume corridors.	Abutting land uses not directly served. Access and egress points are served by on-and off-ramps.	20,000 to 75,000+	High speed, divided highway with full control of access and grade separated interchanges. May have a very limited number of at-grade intersections.
Principal Arterials - Others	Serve longest trip demands and highest traffic volume corridors, where not served by freeways.	Serve major economic activity centers.	15,000 to 50,000	Typically a divided road with limited or no driveways to specific parcels and at-grade intersections with other roadways.
Minor Arterials	Interconnect with and augment the principal arterial system and provide service for trips of moderate length.	Serve important economic activity centers. Distribute traffic to smaller geographic areas than those served by higher-level arterials, with more emphasis on service to abutting land uses.	6,000 to 20,000	Number of lanes and type of median directly related to traffic volumes and abutting land uses.
Collectors	Connect local streets to the arterial street system.	Serve both residential neighborhoods and commercial/industrial areas; provide access to abutting land uses.	3,000 to 9,000	Typically two-lane streets with more frequent intersections.
Locals	Serve the ends of most trips.	Provide direct access to adjacent land.	100 to 7,500	Typically two-lane streets.

The Federal Functional Classification System divides roadways into four major classes: principal arterials, minor arterials, collectors, and local roadways. Principal arterials are further subdivided into the Interstate system, other freeway, and other (including expressways and signalized local arterial streets), while collectors are subdivided into major and minor in rural areas.

Urban Roadway Functional Classifications[1]

- *Principal Arterial:* Principal arterials serve major economic activity centers of an urban area, the highest average daily traffic (ADT) corridors, and regional and longer intra-urban trips. In every urban area, the longest trips and highest ADT are characteristic of the main entrance and exit routes. Because these routes are generally extensions of the highest rural functional routes, they should be principal arterials. Principal arterial trip lengths are indicative of the rural-oriented traffic entering and exiting the urban area on the rural arterial system, as well as the longest trans-urban area travel demands.

- *Minor Arterial*: Urban minor arterials serve important economic activity centers, have moderate ADT, and serve intercommunity trips interconnecting and augmenting the principal arterial system. Trip lengths are characteristic of the

[1] Highway Functional Classification Concepts, Criteria, and Procedures (FHWA, 2013) and Functional Classification Criteria (WisDOT, April 2013).

rural-oriented traffic entering and exiting the urban area on the rural collector system. In conjunction with principal arterials, minor arterials provide an urban extension of the rural collector system to the primary central business district (CBD) and critical links to satellite community CBDs.

Although the predominant function of minor arterials is traffic mobility, minor arterials serve some local traffic while, providing greater land access than principal arterials. As such, minor arterials may end abruptly at major traffic generators.

- *Collector*: Collectors provide direct access to residential neighborhoods, commercial, and industrial areas, and serve inter-neighborhood trips. As the name implies, these routes collect and distribute traffic between local streets and arterials. In the CBD and similar areas, the collector system may be a part of the street grid.

  Collectors may end abruptly where they penetrate residential neighborhoods and serve isolated traffic generators, but should generally be linked to other collectors and arterials for traffic circulation. The travel mobility and land access functions of collectors are similar, as shown in Figure 3-4.

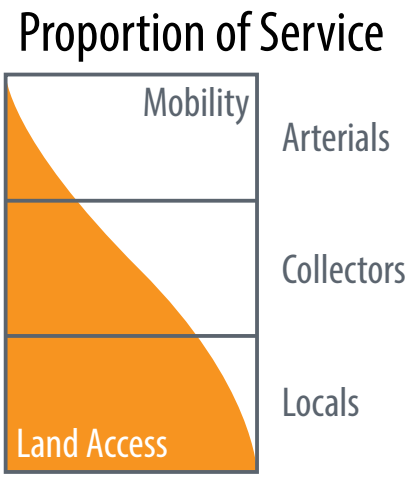


Figure 3-4: Proportion of Service Provided by Roadway Facilities.
Mobility and land accessibility vary according to the three primary functional classes. Arterial roadways provide mostly mobility; locals provide mostly land access; and collectors generally provide an equal amount of travel mobility and land access. (FHWA)

- *Local*: Local streets predominantly serve to provide access adjacent land uses. They serve the ends of most trips. All streets not classified as arterials or collectors are local streets.

Figure 3-5

Characteristics of Roadway Functional Classes

Functional Class	Distance Served and Route Length	Access Points	Speed Limit	Distance Between Routes	Usage	Significance	Number of Lanes
Arterial	Longest	Few	Highest	Longest	Highest	Statewide	More
Collector	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Local	Shortest	Many	Lowest	Shortest	Lowest	Local	Fewer

As state departments of transportation and MPOs continue to move towards a more performance-based management approach, functional classification will be an increasingly important consideration in setting expectations and measuring outcomes for preservation, mobility and safety.

Pavement Condition

Pavement condition management extends the useful life of a roadway and saves money by ensuring roadway preservation work occurs during the most efficient time in the pavement's lifecycle. Extreme pavement degradation can be minimized by performing preservation treatments early in the life-cycle of a roadway mentioned on the next page.

The Pavement Surface Evaluation and Rating (PASER) system is used to assist local communities in evaluating the condition of municipal roadways. The PASER rating system was developed by researchers at the University of Wisconsin-Madison to be a

quick, comparable way to evaluate surface conditions of pavement. The system rates pavements along a scale from 1-10 and prescribes treatment options accordingly, as is described in Figure 3-6.

Figure 3-6

PASER Ratings and Corresponding Treatments

Quality	Rating	Treatment for Pavement	Treatment for Concrete
Excellent	9-10	No maintenance required	No maintenance required
Good	7-8	Crack sealing and minor patching	Routine maintenance
Fair	5-6	Preservation treatments (non-structural)	Surface repairs, partial-depth patching
Poor	3-4	Structural renewal (overlay)	Extensive slab or joint rehabilitation
Very Poor	1-2	Reconstruction	Reconstruction

For state roadways, WisDOT uses the more sophisticated Pavement Condition Index (PCI) to evaluate pavement condition. PCI was developed by the United States Army Corps of Engineers, and uses a visual survey to measure the distress of pavement. This widely utilized method of pavement condition measurement factors in a number of pavement distress types:

- ride quality
- alligator cracking
- bleeding
- block cracking
- bumps and sags
- corrugation
- depression
- edge cracking
- joint reflection cracking
- lane/shoulder drop-off
- longitudinal and transverse cracking
- patching and utility cut patching
- polished aggregate
- potholes
- railroad crossing
- rutting
- shoving
- slippage cracking
- swell
- weathering and raveling

In addition to these pavement distress types, PCI rates distress in jointed concrete pavements. The system rates pavements along a scale of 0-100 in which 0 is the worst possible roadway condition and 100 is a new roadway. For simplicity, this scale has been converted to the PASER scale where used in the RTP.

In general, roadways with a pavement condition of "fair" or worse are nearing the end of their repairable life. Lower volume roads routinely fall into this category, while high-volume, regional mobility corridors rarely do. In 2015, the Madison metropolitan area pavement condition varied by facility type:

- 96% of the interstate highway system is in good condition
- 89% of the US highway system is in fair or better condition
- Roughly 16% of the state highway system is in poor or worse condition
- About 60% of local facilities (arterials, collectors, and local roads) are in good condition and roughly 30% are in fair condition.

Some of the regional roadways in the poorest condition in 2015 include:

- WIS 113 from Kennedy Road to the WIS 19 (fair)
- WIS 113 north of Waunakee to CTH V (very poor to fair)
- WIS 19 from US 12 to Waunakee(very poor to poor)
- US 14 from the Beltline to Cross Plains (very poor to poor)
- The Beltline from the Broadway ramp to the Yahara River Bridge (very poor)
- Park Street from the Beltline north to West Washington Avenue (poor to fair) - *scheduled for concrete and joint repairs in*

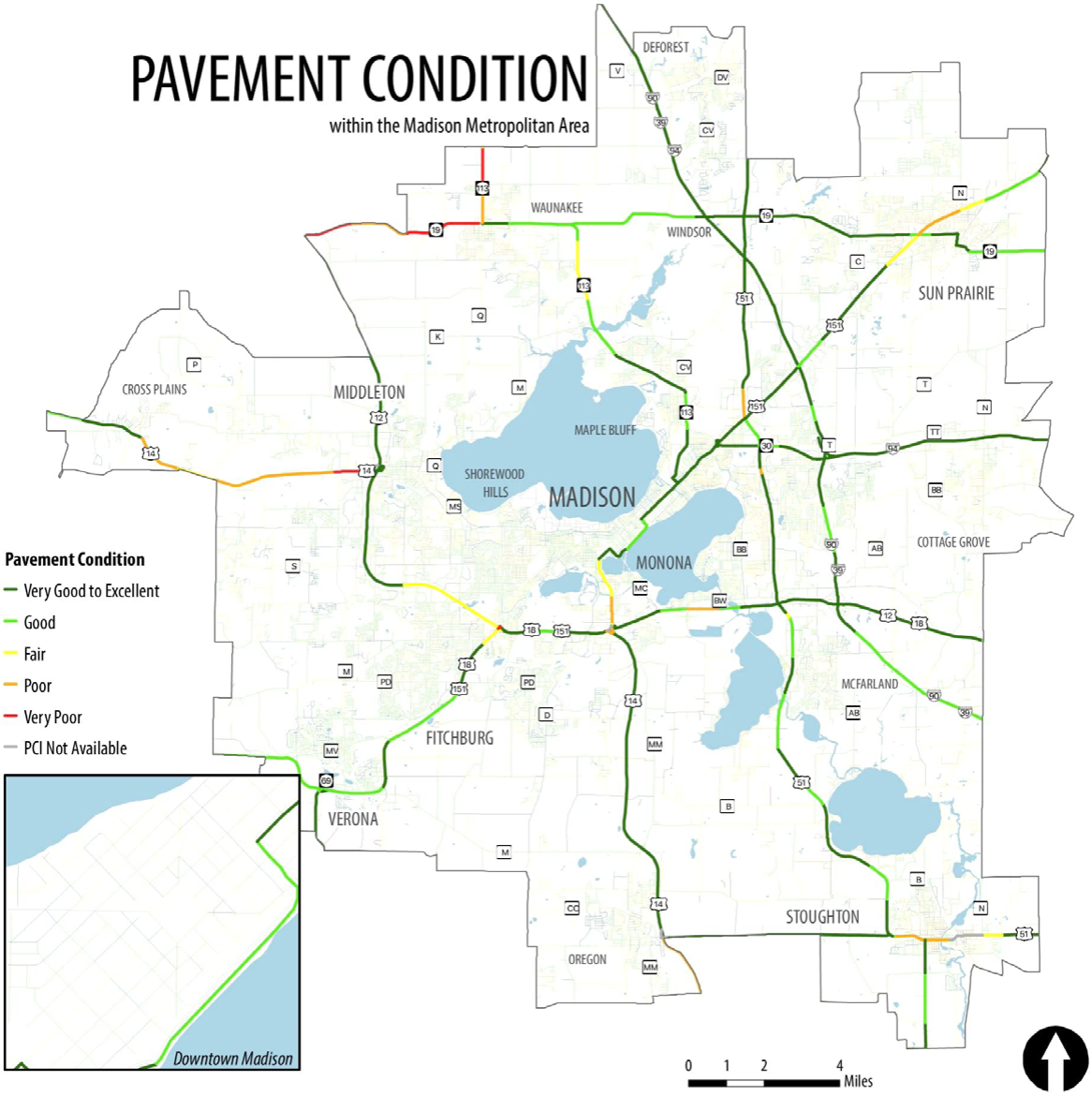


Figure 3-7: Pavement Condition

2019-2020

- US 51 from East Washington Avenue to Pierstorff Street (very poor)
- US 151 in Sun Prairie from the Main Street ramp to the Columbus Street bridge (very poor to poor) - *scheduled for resurfacing in 2018*
- US 14 from WIS 138 to County Highway A (very poor)
- US 51 in Stoughton from WIS 138 to Fourth Street (very poor) - *portion scheduled for resurfacing in 2018*

Some of these regional facilities, such as US 151 and Park Street, are programmed for improvements. Recent trends in roadway condition demonstrate a reduction in the pavement quality of local facilities and an improvement in overall quality of state facilities. Much of this change can be attributed to changes in state-level priorities and funding levels. In recent years, reductions in local roadway funding have led to reductions in local pavement ratings statewide.

Bridge Condition

The Federal Highway Administration (FHWA) compiles the National Bridge Inventory (NBI), a database with information about every bridge and tunnel in the US. As part of this inventory, bridges are given a "sufficiency rating" based on over twenty categories that surmise a bridge's structural condition, obsolescence of its design, and essentialness to the public. A low rating can be earned not only for poor structural conditions, but also for a design that is not adequate for current traffic conditions. Approximately 55% of the rating is derived from the structural evaluation of the bridge, 30% from the obsolescence of its design, and 15% the essentialness to the public.

Bridge sufficiency ratings are a key factor for funding. A sufficiency rating of 80 or less qualifies a bridge for federal repair funding, while a score of 50 or less qualifies a bridge for federal replacement funding. Federally funded bridge projects require a 20% local funding match.

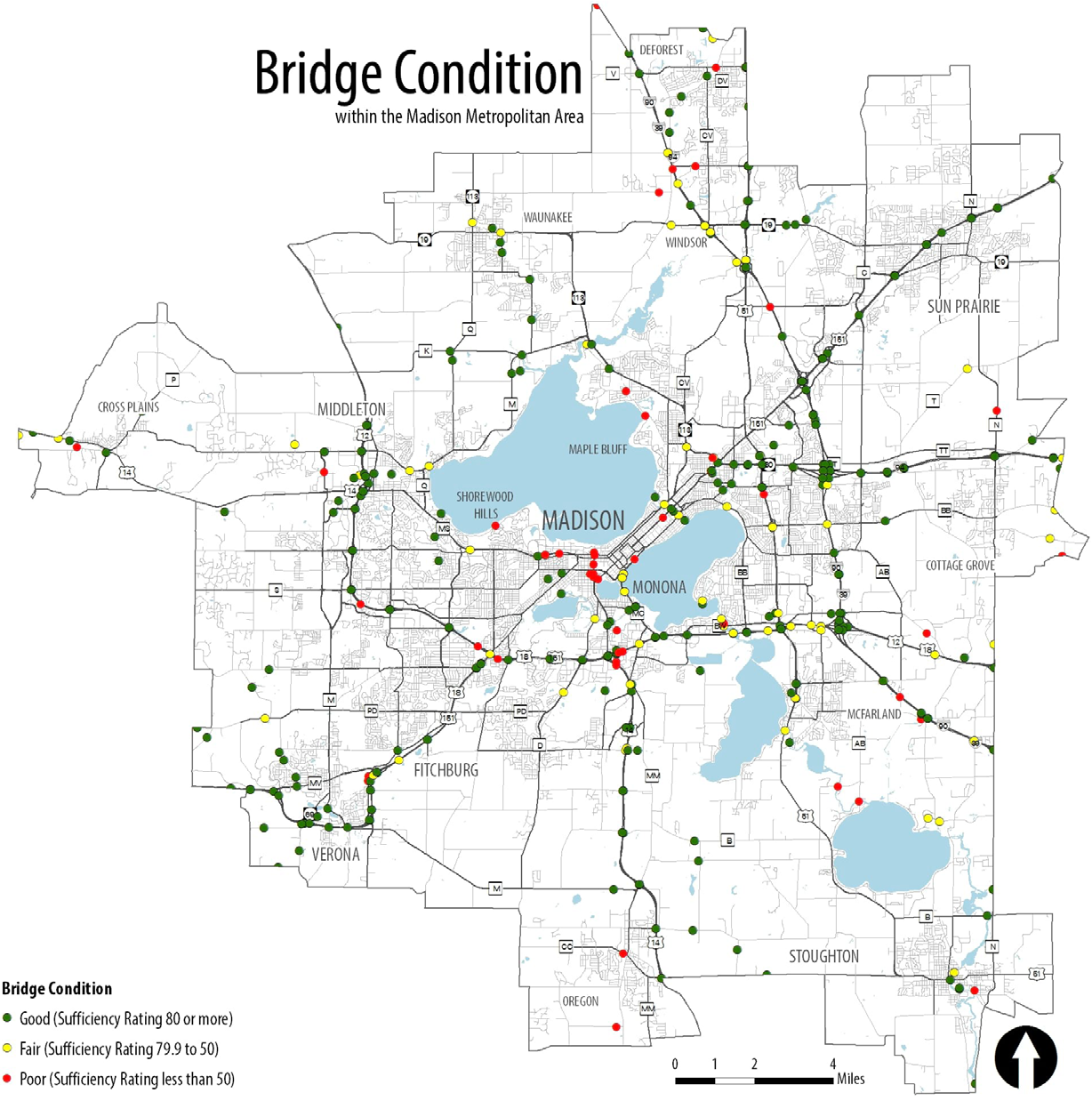


Figure 3-8: Bridge Condition

In the Madison area, 95% of all bridges are in fair or better condition. In fact, 75% of all bridges are in good condition. There are 17 bridges in the region in poor condition including:

- County Highway PB (Badger Mill Creek) - *Scheduled for replacement in 2017*
- County Highway AB (Yahara River)- *Scheduled for replacement in 2019*
- County Highway MN (Door Creek)
- County Highway PD (Badger Mill Creek)
- Windsor Road (Yahara River)
- County Highway N (Koshkonong Creek)
- River Road (I-90/94)- *Scheduled for replacement in 2017*
- WIS 30 westbound (Fair Oaks Avenue)
- Femrite Drive (Door Creek)
- High Point Road (Beltline Highway)- *bridge replacement underway*
- County Highway AB (I-90)
- County Highway KP (Black Earth Creek)



Replacement of the County Road V bridge in DeForest.

Motor Vehicle Safety and Crash Data

The Wisconsin Traffic Operations and Safety (TOPS) lab maintains a database of all reported crashes in the state. Between 2010 and 2014, Dane County experienced an average of 6,817 crashes per year, resulting in a 5-year average crash rate of 140 crashes per 100 million vehicle miles traveled (VMT). During this period there were 154 total crash fatalities (0.63 fatal crashes per 100 million VMT) and 699 crashes resulting in serious injury (3.54 serious injury crashes per 100 million VMT). The number of fatalities remained relatively stable from year to year during the period, while the number of serious injury crashes declined from 195 in 2010 to 145 in 2014. The remaining 96% of crashes resulted in property damage only. In early 2016, the FHWA released rules establishing how to measure the number and rate of fatal and serious injury crashes on the transportation network. MATPB now tracks these measures annually in its Performance Measures Report (Appendix I).

Figure 3-9 shows the location of intersections with high severe crash frequencies. As expected, the highest volume arterials including the Beltline, East Washington Avenue, Stoughton Road (US Highway 51), Mineral Point Road, Verona Road, and Gammon Road have the highest crash frequencies. The 10 intersections with the highest number of severe crashes include:

- Verona Road (US 18/151) and CTH PD
- East Washington Avenue and Thierer Road
- Stoughton Road (US 51) and North Broadway
- East Washington Avenue and 1st Street
- Park Street and Badger Road
- US 12/18 and Millpond Road
- John Nolen Drive and North Shore Drive
- Beltline and the north Whitney Way ramps
- Fish Hatchery Road and Greenway Cross
- University Avenue and Midvale Boulevard

WisDOT identifies road segments on the state system with crash rates that exceed the statewide average for similar roadway types, shown in Figure 3-10. Further analysis is warranted for these segments to determine if there are any potential short-term and/or long-term engineering or traffic control solutions to enhance safety. The West Beltline expansion and Verona Road Interchange reconstruction is expected to improve the safety issues in that area. WisDOT completed a Safety and Operations Study for WIS 19 in 2016, and will be reconstructing the WIS 19/WIS 113 intersection in 2018, and will add two lanes on WIS 19 between River Road and Interstate 39/90/94 in 2020. The Beltline corridor and US 51 are the subject of ongoing major corridor studies which include safety issues as project needs.

The City of Madison Traffic Engineering Division prepares an annual crash report with statistics, maps, charts, and tables summarizing common factors for crashes, high crash locations, historical trends, and other information. This information,



including detailed crash diagrams, is used to assist engineers in planning strategies to reduce crashes and identify possible engineering solutions.

The Dane County Traffic Safety Commission; comprised of staff from the Dane County Highway and Transportation Department, the Dane County Sheriff Department, WisDOT Central and Region Offices, and the State Patrol; meet quarterly to review crash data – particularly fatalities, and to discuss safety issues such as planned projects, research, grant programs, and proposed legislation.

WisDOT's 2014-2016 Strategic Highway Safety Plan is a statewide comprehensive plan that provides a unified framework to reduce traffic fatalities, injuries and crashes over a three year period. The plan examines various highway safety issues in Wisconsin. Additionally, each year WisDOT prepares a report on the programs, grants and activities planned for the next federal fiscal year, which also serves as the state's application for federal safety funds, and submits the plan to the National Highway Transportation Safety Administration. WisDOT administers the federal Highway Safety Improvement Program (HSIP) funds, which can be used for projects that reduce the number and severity of crashes on public roads. This program focuses on infrastructure improvements selected through a data-driven approach, with an emphasis on low-cost treatments that can be implemented quickly.

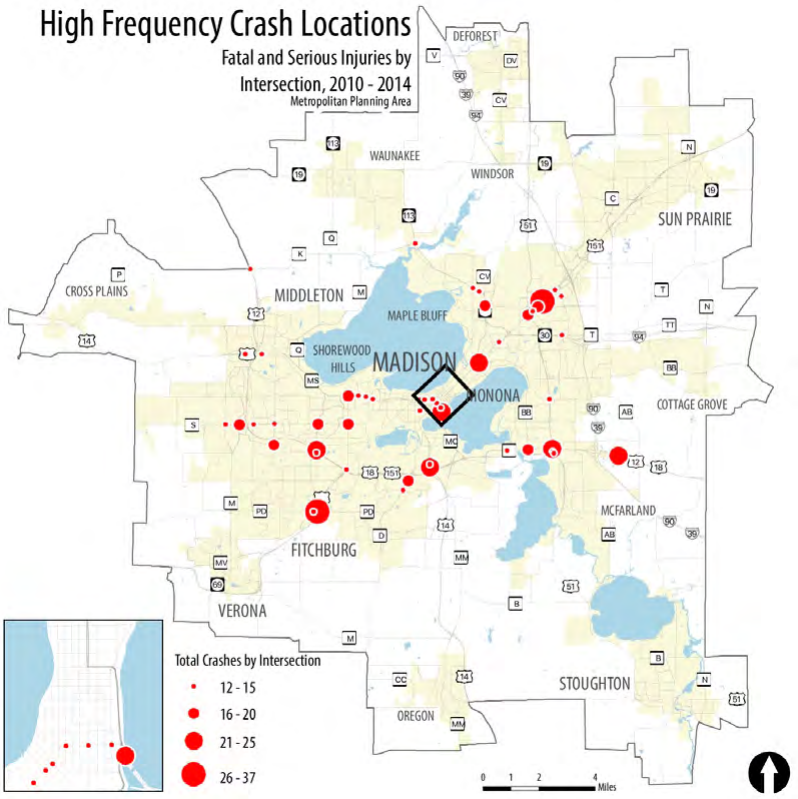


Figure 3-9: High Frequency Crash Locations

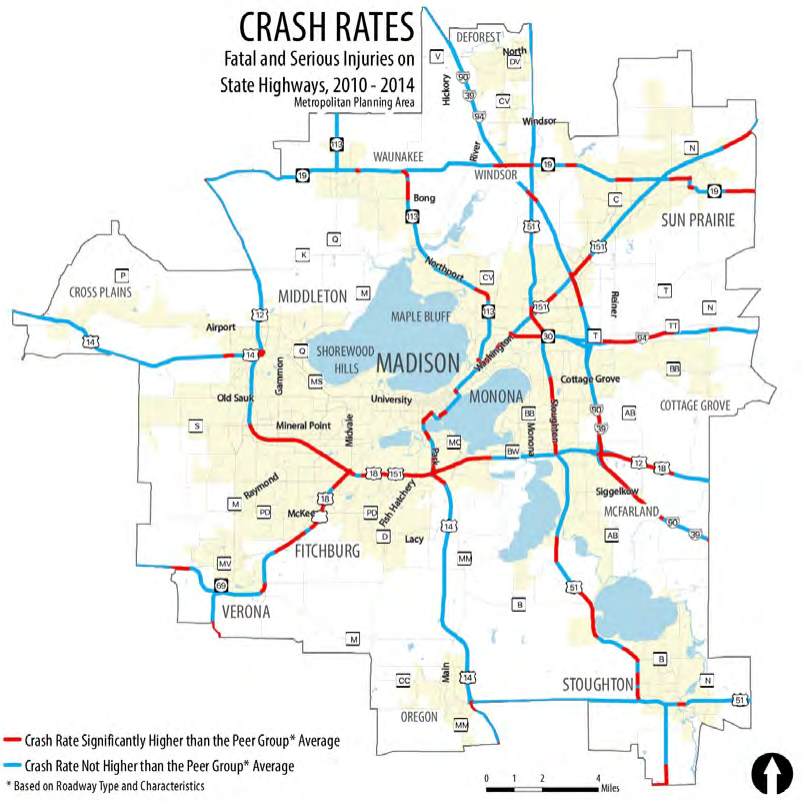


Figure 3-10: Crash Rates on State Highways

Traffic Growth and Congestion

The growth in population and employment in the metro area, combined with an increasing number of commuters from outside the area has led to increasing traffic volumes on the regional roadway system. Following a dip in VMT during the Great Recession starting in 2008, VMT has begun to increase again the past three years. Figure 3-11 provides daily VMT estimates for Dane County from 2000 to 2015. VMT increased on average 0.6% per year during this time period. Average daily car travel per person declined by about 10 percent during this period, falling from 29 to 26 VMT per day. National data shows per capita VMT beginning to rise again since 2014 with miles traveled among those 16 and older about where it was in 1998.

Figure 3-11

Estimated Daily VMT for Dane County

Year	VMT	Change from Previous Year
2000	12,497,100	-
2001	12,636,700	1.1%
2002	13,202,000	4.5%
2003	13,256,000	0.4%
2004	13,450,000	1.5%
2005	13,346,300	-0.8%
2006	13,621,900	2.1%
2007	13,561,000	-0.4%
2008	12,993,400	-4.2%
2009	13,214,200	1.7%
2010	13,258,300	0.3%
2011	13,116,500	-1.1%
2012	13,724,431	4.6%
2013	13,291,000	-3.2%
2014	13,481,513	1.4%
2015	13,637,621	1.2%

Figure 3-12 shows average weekday traffic (AWT) volume on the arterial roadway network in 2013, while Figure 3-13 shows the AWT volume change from 1992 to 2013.

The most significant traffic growth over this time period occurred on the Beltline between Verona Road and I-39/90 and on I-39/90 between the Beltline and US 151. AWT volumes on these roadways increased more than 30,000 per day. The Beltline is the only centrally-located roadway that directly connects the west and east sides of the metropolitan area. According to data collected for WisDOT's Beltline study, over one-half of all vehicles that use the Beltline, exit after passing four interchanges or less.

Traffic volumes also grew significantly on radial arterials outside of the Beltline and Interstate system. This includes US 18/151 (Verona Road), US 14, CTH S (Mineral Point Road), and CTH M (S.









Pleasant View Road). CTH K and WIS 19, circumferential routes on the north side, also saw significant traffic growth. Recently completed and programmed projects have or will be addressing capacity issues on US 18/151, including its interchange with the Beltline, CTH S (Mineral Point Road), and CTH M (S. Pleasant View Road). An existing bottleneck at the US 12/CTH K intersection was addressed in 2015. The intersection of CTH M and CTH K also experiences significant peak hour traffic congestion and needs improvement.

Traffic growth has also occurred on some of the radial arterials inside the Beltline, including WIS 30, East Washington Avenue, University Avenue, and Park Street. Volumes on other radial arterials in the central area, such as Monroe Street, Regent Street, and Johnson/Gorham have remained fairly consistent over the 1992 to 2013 time period, but can fluctuate from year-to-year. Traffic has remained steady in part because the downtown/ isthmus area has not seen much growth in employment compared to peripheral employment centers. Additionally, these arterial roadways through the downtown/ isthmus area are near capacity during peak commute times. Therefore, drivers are choosing alternative routes either south or north around the lakes for cross town trips.

According to travel data collected for the Beltline Study, during the weekday a.m. peak period only 10-20% of traffic traveling in the downtown/isthmus does not have an origin or destination there.

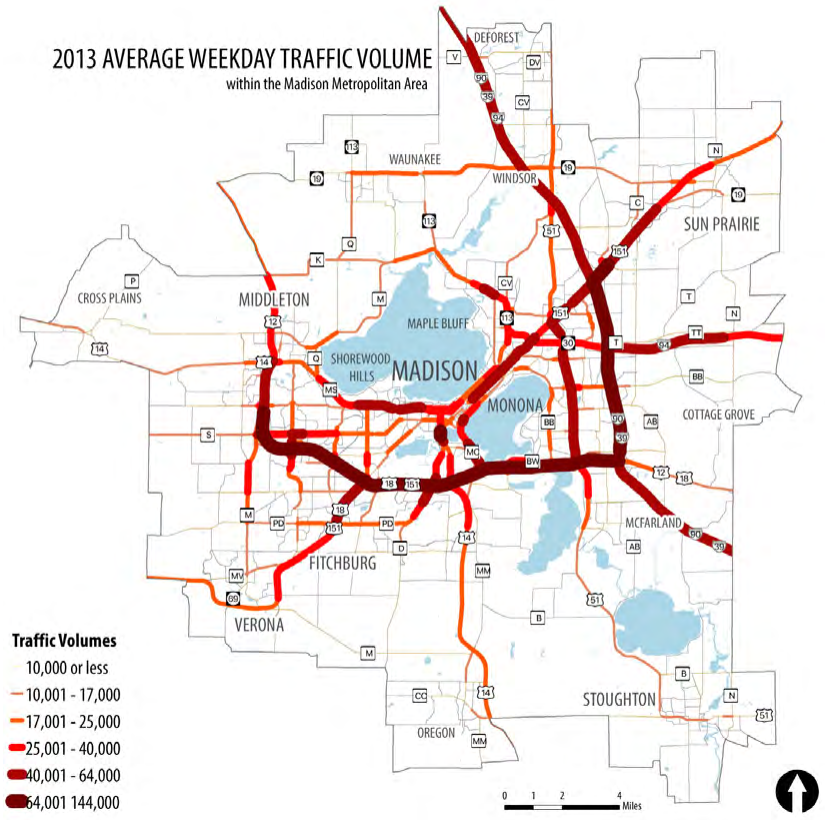


Figure 3-12: 2013 Average Weekday Traffic Volume

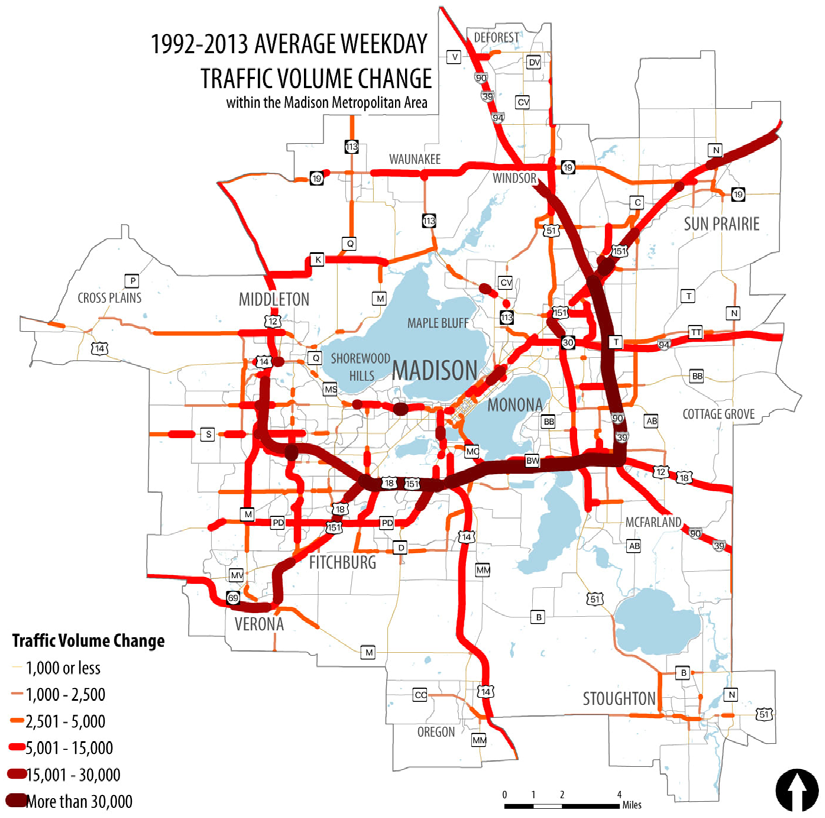


Figure 3-13: 1992-2013 Average Weekday Traffic Volume Change

Congestion Mitigation Strategies

Dane County's roads are busier than ever before. In fact, according to WisDOT's estimate average daily vehicle miles of traveled, or VMT, in the county reached a new high in 2015 of 13.6 million miles. This extra traffic means that the potential for congestion, unreliable commute times, and unsafe roadway conditions is higher than ever.

Roadway congestion is common during the morning and afternoon rush hour periods on heavily traveled regional roadways. Related to congestion is travel time reliability – the variability in travel times that can occur from one day to the next. For most commuters, recurring peak period congestion is understood, anticipated, and planned for.

Drivers generally budget extra time to allow for routine delays, whereas unanticipated variability or delays can be a source of frustration as it can make commuters late for work, cause buses to run late, make business travelers late for appointments or meetings, cause truckers to be charged for late deliveries, and can disrupt the just-in-time delivery process. In many cases, rush hour congestion is difficult or impossible to solve due to physical constraints, costs, and the negative impacts of roadway expansion; however, reliability can be improved through a variety of operational enhancements and incident response management techniques.



The following are the seven commonly accepted sources of congestion that can lead to travel time reliability issues. Capacity limitations of roadways, or physical bottlenecks, only account for, on average, about 40% of the delay.[2]

1. Physical Bottlenecks (40%) – Capacity limitations due to design of motorway
2. Traffic Incidents (25%) – Crashes and accidents that impeding travel lanes
3. Work Zones (10%) – Construction activities that result in physical changes to motorway
4. Weather (15%) - Snow, rain, or other events that change driver behavior and impact flow
5. Traffic Control Devices (5%) – Poorly timed signals, rail crossings, etc.
6. Special Events (5%)– Sporting events, concerts, etc. that cause surges in traffic demand
7. Fluctuations in Normal Traffic – Day-to-day variations that lead to high-demand days

Complicating things, many of these sources of congestion can trigger another source to occur (a weather event causing a crash, a special event making a work zone bottleneck worse, etc.). This means that significant payoffs can be expected by implementing a comprehensive congestion management process (CMP) that includes travel demand management (TDM) and transportation system management (TSM) and operations strategies such as transit and ride-sharing incentives, traffic signal coordination, traveler information, and enhanced incident response, along with physical bottleneck relief through targeted capacity expansion.

[2] https://ops.fhwa.dot.gov/congestion_report/executive_summary.htm

Congestion Management Process for the Madison Area

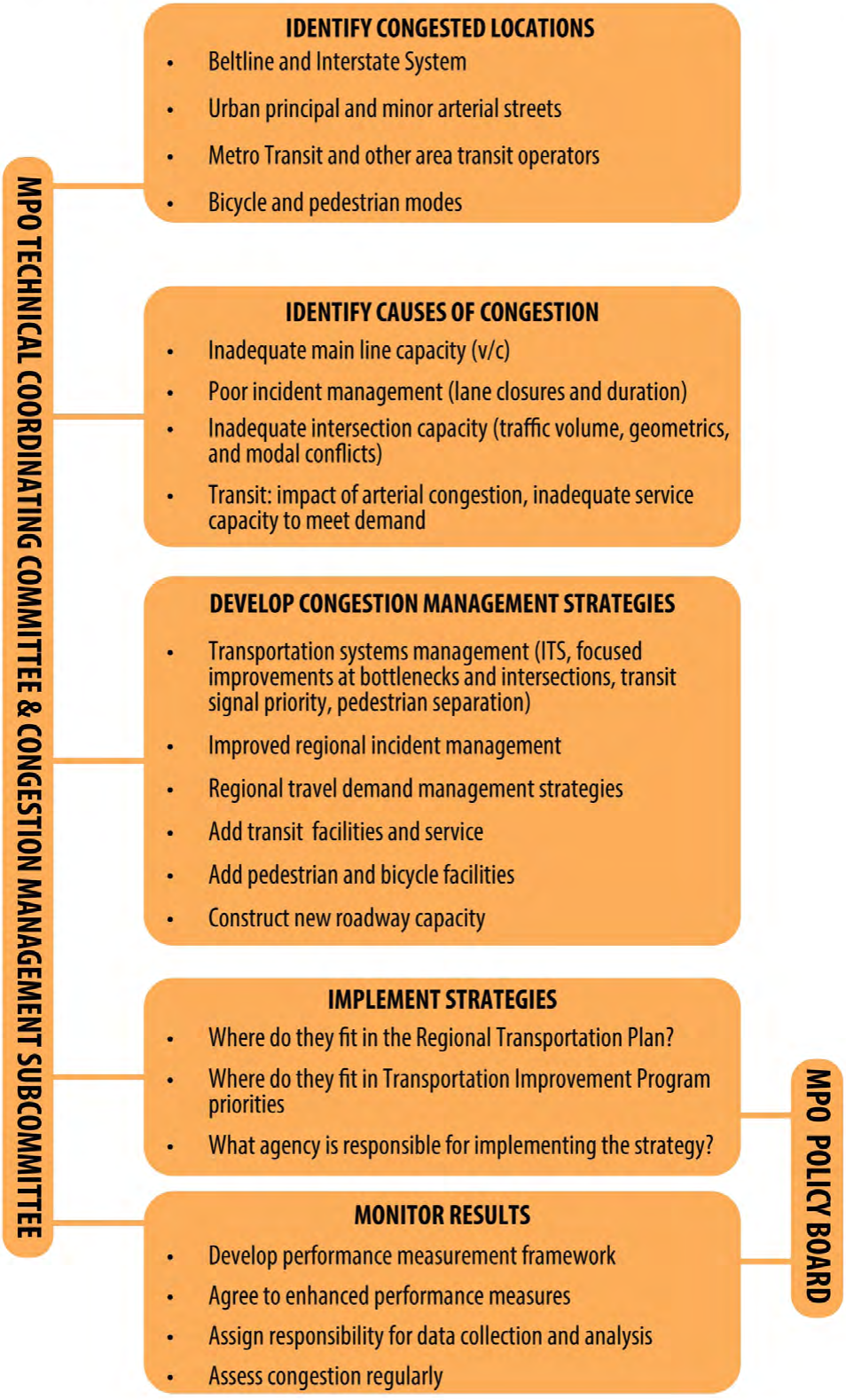


Figure 3-9: Congestion Management Process for the Madison Area

Congestion Management Process

A Congestion Management Process, or CMP, is a systematic process that provides information on transportation system performance and provides alternative strategies to alleviate congestion and enhance the mobility of people and goods. In short, it is a way to get the most out of the existing transportation system. Metropolitan planning organizations are required to maintain a CMP if planning for an area with a population of over 200,000. MATPB adopted its most recent CMP in November 2011.



FHWA says that CMPs must include:

- Methods to monitor and evaluate the performance of the multimodal transportation system, identify the causes of recurring and non-recurring congestion, and identify and evaluate alternative strategies
- Objectives and performance measures to assess the extent of congestion and support the evaluation of the effectiveness of congestion reduction and mobility enhancement strategies for the movement of people and goods that have been deemed acceptable by local transportation officials, the MPO, State DOT
- Establishment of a coordinated program for data collection and system performance monitoring to define the extent and duration of congestion, to contribute in determining the causes of congestion, and evaluate the efficiency and effectiveness of implemented actions
- Identification and evaluation of the anticipated performance and expected benefits of appropriate congestion management strategies that will contribute to the more effective use and improved safety of existing and future transportation systems based on the established performance measures
- Identification of an implementation schedule, implementation responsibilities, and possible funding sources for each strategy (or combination of strategies) proposed for implementation
- Implementation of a process for periodic assessment of the effectiveness of implemented strategies, in terms of the area's established performance measures



Depending upon the need, recommendations for congested corridors can range from implementing better incident management to strategic capacity enhancement. Recommendations will fall into one of three categories: TSM, TDM, or capacity enhancement. The type of recommendation will depend on need, available right of way, land use context, cost, and other considerations. Per MATPB policy, roadway capacity enhancements are generally considered only after implementing both TDM and TSM strategies and not achieving anticipated or desired congestion reduction. A Level of Service (LOS) of D is generally considered acceptable, and service levels lower than that must sometimes be tolerated in certain areas such as downtowns due to right of way constraints and the negative impacts of expanded roadway capacity such as impacts to other roadway users and removal of parking.

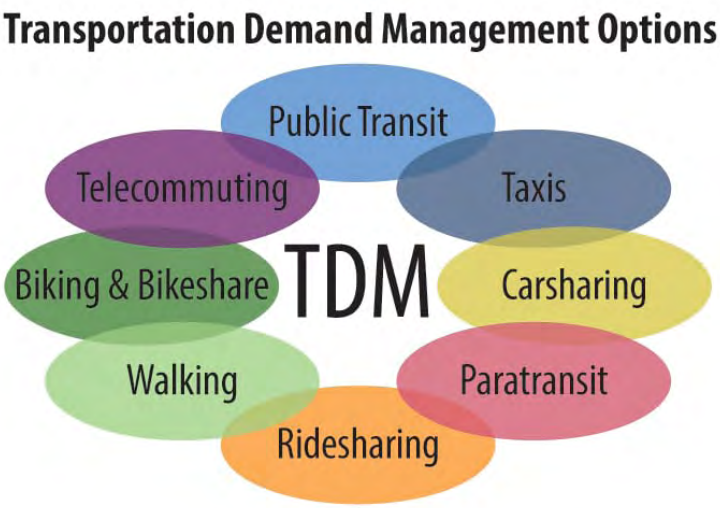


Transportation System Management (TSM)

TSM is a planning tool that focuses on increasing the efficiency of the transportation system by active management of facility operations using technology to minimize the effects of incidents or recurring vehicle congestion. This strategic approach places emphasis on improving existing system efficiency by utilizing intelligent transportation system (ITS) technology to ensure that drivers are aware of incidents, that incidents are attended to rapidly, and that the network responds to sudden fluctuations in driving conditions. This approach also examines and implements future technologies that can improve system efficiency such as connected vehicle technology, coordinated, staged, or adaptive traffic signals, and dynamic message signs. ITS is increasingly becoming a key component of TSM.

Transportation Demand Management (TDM)

TDM is a planning tool that focuses on increasing the number of options for people utilizing the transportation system and incentivizing the use of those options. TDM strategies include increasing awareness and utilization of public transportation, taxis (including app-based services), car sharing, paratransit, ridesharing, vanpooling, carpooling, walking, bike sharing, and telecommuting. Additionally, transportation demand can be managed by adopting land use policies that encourage more compact development with mixed uses and well-connected street networks that can reduce trip length and frequency while providing an environment that is supportive of non-auto modes of travel. More information about TDM, including strategies being implemented by MATPB, can be found on page 3-31.



BICYCLES

Existing Bikeway System

The Madison metropolitan area is served by an interconnected bikeway network, consisting of off-street shared-use paths, on-street bike lanes, and local streets. Bikeway construction began in earnest in the 1990s and most major roadway projects now feature provisions for bicyclists as well as pedestrians. Several rail and other corridors have been utilized to build high quality shared-use paths.

The 2015 Bicycle Transportation Plan organized components of the bikeway system into a regional network of primary and secondary bicycle routes consisting on-street and off-street segments (see Figure 3-14). This network helps planners visualize the bikeway network as it is used by cyclists, identify gaps, and prioritize improvements. The Bicycle Transportation Plan identifies regional bicycle infrastructure needs and outlines recommended regional priority path segments to improve the connectivity of the system and build a truly regional network.

Most communities in Dane County also engage in bikeway planning. The City of Madison has worked cooperatively with MATPB staff to develop and adopt the regional bicycle plan. The Cities of Fitchburg (2017) and Middleton (2009) regularly update their local plans. Other communities including Sun Prairie, Stoughton, McFarland, and Verona have undertaken updated bicycle route mapping and studies to identify and prioritize planned facilities. Local comprehensive and/or recreation and open space plans typically include a bicycle transportation component. The City of Madison also plans for bicycle infrastructure as part of preparation of neighborhood development plans.

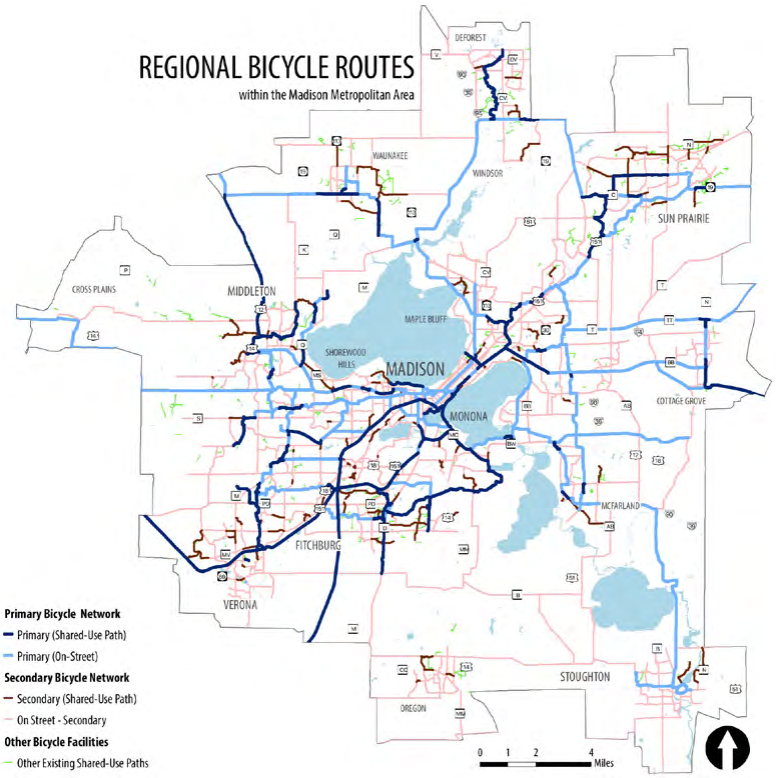


Figure 3-14: Regional Bicycle Routes

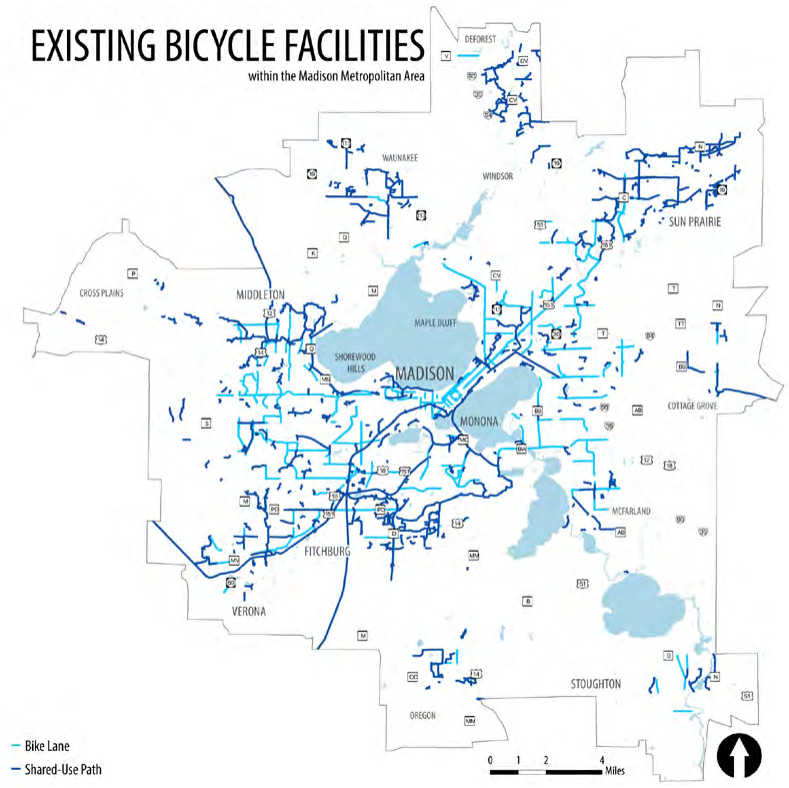


Figure 3-15: Existing Bicycle Facilities

Bicycle Facilities

Bicycle facilities consist of a combination of shared-use paths and on-street facilities such as bike lanes and paved shoulders (in rural areas) and bike boxes and other intersection improvements. Appropriate bicycle facilities are generally included on street corridors as they are reconstructed, if possible. Newer innovative features are now beginning to be added such as separated bicycle lanes and bike signals. Still, gaps in the network persist that make it difficult for cyclists to operate safely and comfortably and access destinations. The 2015 Bicycle Transportation Plan identified several types of bicycle facilities used in the Madison area and around the U.S. Bicycle facilities are chosen based on many factors, including the projected usage, safety design, cost, and available space. Figure 3-15 on page 3-19 shows existing bicycle facilities.

Well-connected street networks are important for bicyclists to navigate within neighborhoods. Most of these streets have no specific bicycle treatments – they are unnecessary because of the low traffic speeds and volumes. In some cases, where continuous low-volume streets are used by high volumes of bicyclists and for longer journeys, they may have bicycle priority features like traffic calming, wayfinding signage, and sharrows.

Dedicated bike lanes are used on arterial and collector streets to separate bicyclists from traffic. They may be separated from traffic with a buffer space or vertical element like a curb or row of parked cars. Counter-flow bike lanes are used on one-way streets to allow two-way bicycle traffic.

Shared-use paths are the most comfortable bicycle facilities because they eliminate the need for a bicyclist to interact with traffic outside of street crossings. Shared-use paths are typically built along existing transportation corridors, through parks, and in other locations where land can be secured. However, they often do not provide direct access to homes and businesses.

Paved shoulders wide enough for bicycle use are used in rural areas where bicycle traffic is relatively low. They operate similarly to bike lanes but also serve as emergency stopping lanes for drivers.

Madison is served by a popular and successful bike-share system operated by BCycle. The system currently operates 350 bikes and 40 docking stations (see Figure 3-16). Stations are centered around central Madison but extend out to University Row (University Avenue at Midvale Boulevard), Monroe Street, the Alliant Energy Center, Olbrich Botanical Gardens, and Madison College's Truax Campus. The service attracted about 101,000 bike trips in 2016.

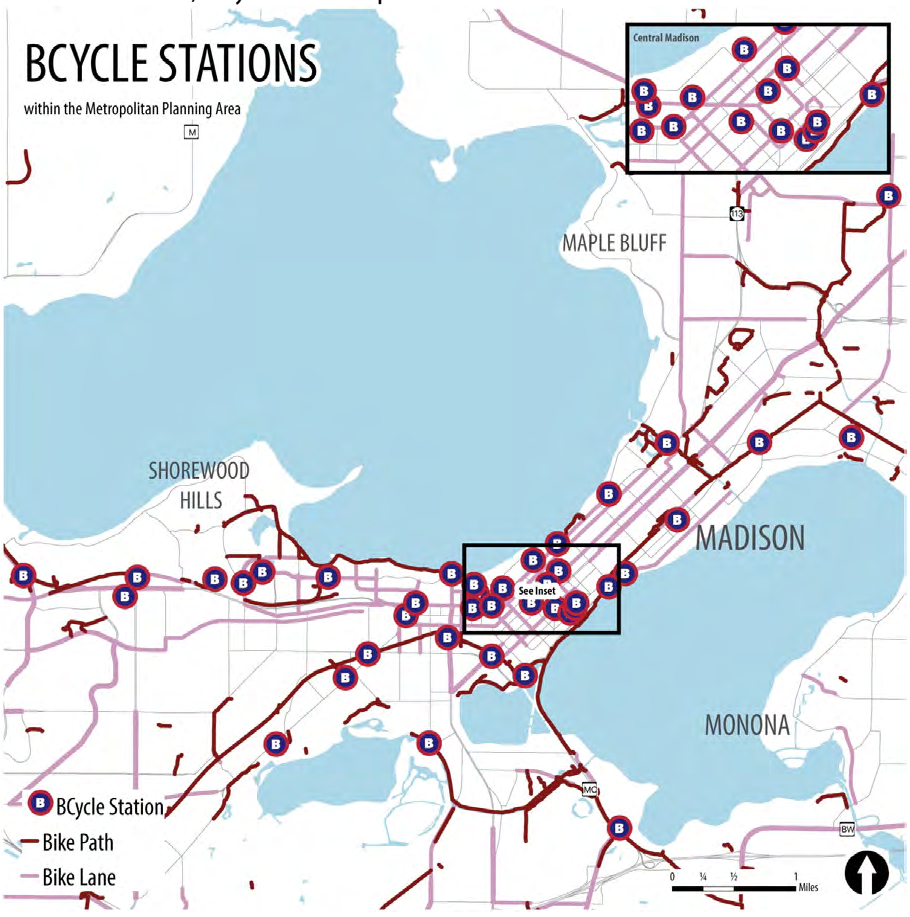


Figure 3-16: BCycle Stations

Education and Encouragement Programs

Education and encouragement programs help people of all ages, backgrounds, and abilities make use of bicycling infrastructure. These programs help people learn to use the roads and paths safely, and help those who are new to bicycling start riding. Other programs help educate motorists about how to safely interact with bicyclists.



Maps and Wayfinding

The Cities of Madison, Fitchburg, Middleton, and other communities publish local bike maps. MATPB, in partnership with Dane County, publishes the Dane County Bicycle Map, which shows the level of bicycle suitability on rural roadways and highlights suitable through routes connecting communities and major destinations in the county. The Wisconsin Department of Transportation provides bike maps for all counties in Wisconsin.



Historically, shared-use paths and bike routes were named and signed by their controlling jurisdictions. The Dane County Bicycle Wayfinding project established standards for marking bicycle routes to provide consistency across jurisdictions, making it easier and more convenient for cyclists to navigate the system.





Bicycle Usage

Bicycle usage has increased dramatically in the last 15 years or so. The U.S. Census provides reliable commute-to-work bicycle counts that show that about 3.6% of commuters in the Madison Urban Area bike to work. The number rises to 5.5% for commuters residing in the City of Madison and exceeds 10% in some central Madison Census Tracts as shown in Figure 3-17. The increases are largely associated with improved bicycle infrastructure, changing attitudes about transportation and the environment, and the cost and availability of parking in central Madison.

Estimating bicycle usage for non-commute trips is extremely difficult. The City of Madison has several bicycle-counting devices at various locations spread throughout the city that show high usage particularly near the UW-Madison campus and on the Southwest and Capital City Paths. A household travel survey is being conducted in 2016-'17, which will provide data on travel by bicycle and other modes for all trip purposes. The survey will also provide information on factors that prevent people from choosing to make more of their trips by bike, foot, and transit.

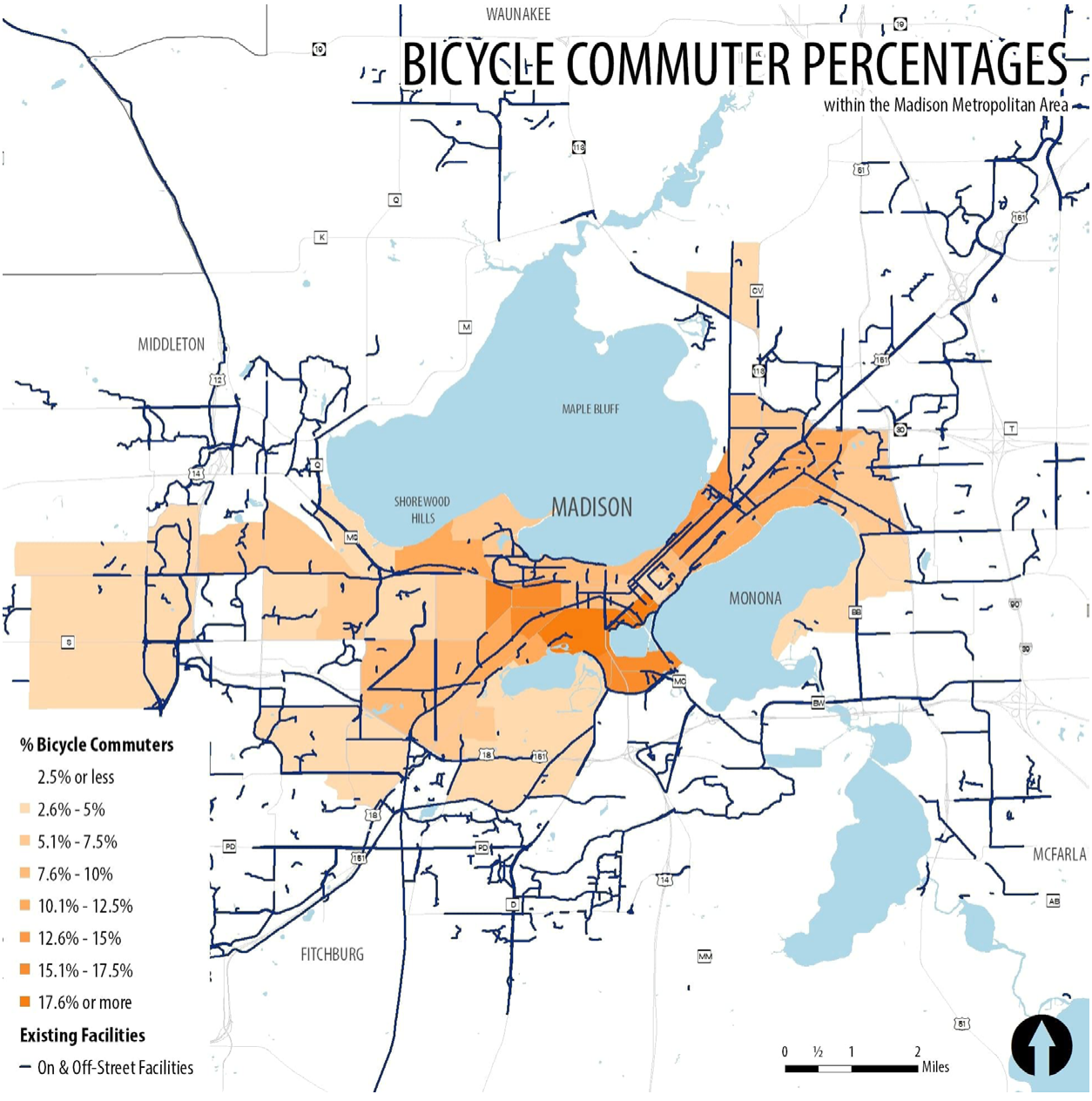


Figure 3-17: Percentage of Commuters Traveling by Bicycle

PEDESTRIANS

Existing Pedestrian System

Pedestrian facilities are important for a safe transportation system that accommodates all users. Sidewalks make walking safer and more pleasant for pedestrians, including the disabled, and provide access to public transit, increasing transportation options for those who may not be able to drive. Having sidewalks on both sides of the street makes walking easier and safer by reducing the number of times pedestrians must cross the street and be exposed to traffic. The City of Madison and other communities have programs that routinely retrofit sidewalks and crosswalks with curb ramps on streets that do not have them and repair sidewalks that are damaged or do not meet modern standards.

All streets benefit from sidewalks. They create a healthier community, as research has shown people will walk more often for recreational purposes if one is provided. Sidewalks, however, are most crucial on urban arterial and collector streets which have higher traffic speeds and volumes and serve more destinations. Sidewalks on these streets provide the most safety benefits and increase the number of transportation trips made by walking. In addition, shared-use paths are also used by pedestrians as an alternative to walking along streets or because they provide shorter routes to destinations.

Intersections represent a special barrier for pedestrians because of the dangers pedestrians face navigating across streets where turning traffic may be passing through the crosswalk and drivers may be focusing on several things at once. Motor vehicle traffic is required to yield to pedestrians at most unsignalized intersections, but compliance is limited.

Sidewalk Coverage

MATPB maintains a county-wide sidewalk database in order to track sidewalk coverage. The database contains information on whether each public street has a sidewalk or shared-use path on both sides, one side, or no sidewalk at all (Figure 3-18). It further tracks whether streets are primarily urban or rural (sidewalks are not normally installed on rural roads) and whether or not a sidewalk is expected, due to existing development and other circumstances. Sidewalks are not normally built on frontage roads, freeways and ramps, and in similar locations.

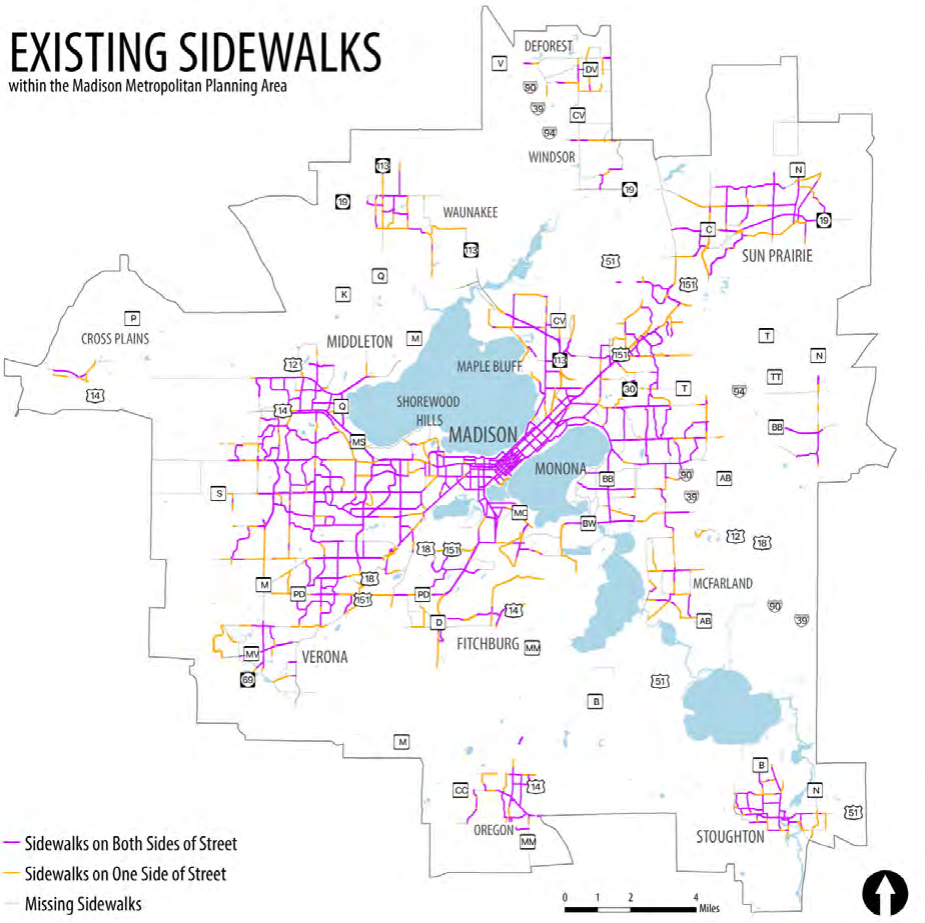


Figure 3-18: Existing Sidewalks

The sidewalk analysis and recommendations in this regional transportation plan focus on collector and arterial streets. In the planning area, about 55% of urban collector and arterial streets by length are estimated to have sidewalks on both sides where they are expected; about 21% have sidewalk on one side, and the remaining 24% have no sidewalk. Many of the urban streets that are missing sidewalk are in peripheral neighborhoods – in some cases sidewalk will be added systematically as the neighborhoods develop.



The Challenges and Trade-Offs with Sidewalks

Although sidewalks are normally included in new construction in most jurisdictions, installing sidewalks along streets in established neighborhoods is sometimes met with local opposition. Residents may be concerned about several issues, including being assessed for the cost of sidewalk installation, the need to clear snow and ice in the winter, and the perceived loss of yard area.

City of Madison residents are charged a special assessment for sidewalk installation and repair. A pilot program was used in 2015 in order to reduce this burden for low-income residents. While it is common for residents or developers to pay a special assessment for the construction of new sidewalks, some municipalities, such as the City of Sun Prairie, do not.

Intersection Treatments

A variety of intersection treatments are used in the Madison area to make intersections safer for pedestrians. Some examples are shown below (see Appendix F for more information on pedestrian facilities and safety treatments).

Marked Crosswalks



Legal crosswalks can be either marked or unmarked. But well marked crosswalks are easier for drivers and pedestrians to see.

Pedestrian hybrid beacons



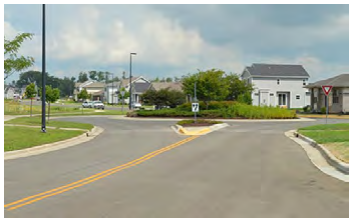
Special traffic signals at an intersection that does not warrant full signalization. The signals are only activated when a pedestrian is present and presses the button.

Rectangular Rapid flashing beacons



Yellow LED lights can, in some cases, be associated with signs at crosswalks to alert drivers at a crosswalk. The lights are activated by a pedestrian.

Median refuge islands



Refuges can shorten distance needed to cross an intersection and allow a pedestrian to make a multi-stage crossing. Refuges should be wide enough to safely accommodate several pedestrians.

Curb extensions



Intersection treatments designed to shorten the effective crossing distance for pedestrians.

Wayfinding signage



In dense commercial areas like downtowns and campuses, wayfinding tools like maps can be valuable for people who are unfamiliar with the area.

Pedestrian Walk Access Analysis

High quality pedestrian facilities are most needed in areas with high population density and a mix of pedestrian-generating land uses like stores, schools, parks, and employment. The pedestrian walk access analysis estimates pedestrian demand using these principles. The analysis counts the number of destinations within walking distance of each Census Block, using a distance-decay function, and assigns each block a destination accessibility score. It then weights the score by Census Block population density, to estimate potential pedestrian demand. Neighborhoods with a high population density and dense mix of walking destinations recieve higher scores. The analysis tool has some limitations as it does not directly account for the attractiveness of the pedestrian environment, such as building orientation, proximity to the street, and other factors. However, it is a useful aid in prioritizing gaps and deficiencies in the pedestrian network. Destinations included in the walk access analysis include:

- Coffee shops, banks, and retail outlets
- Child care centers, schools, and colleges and universities
- Grocery stores
- Restaurants
- Community centers, libraries, and places of worship
- Medical facilities
- Parks

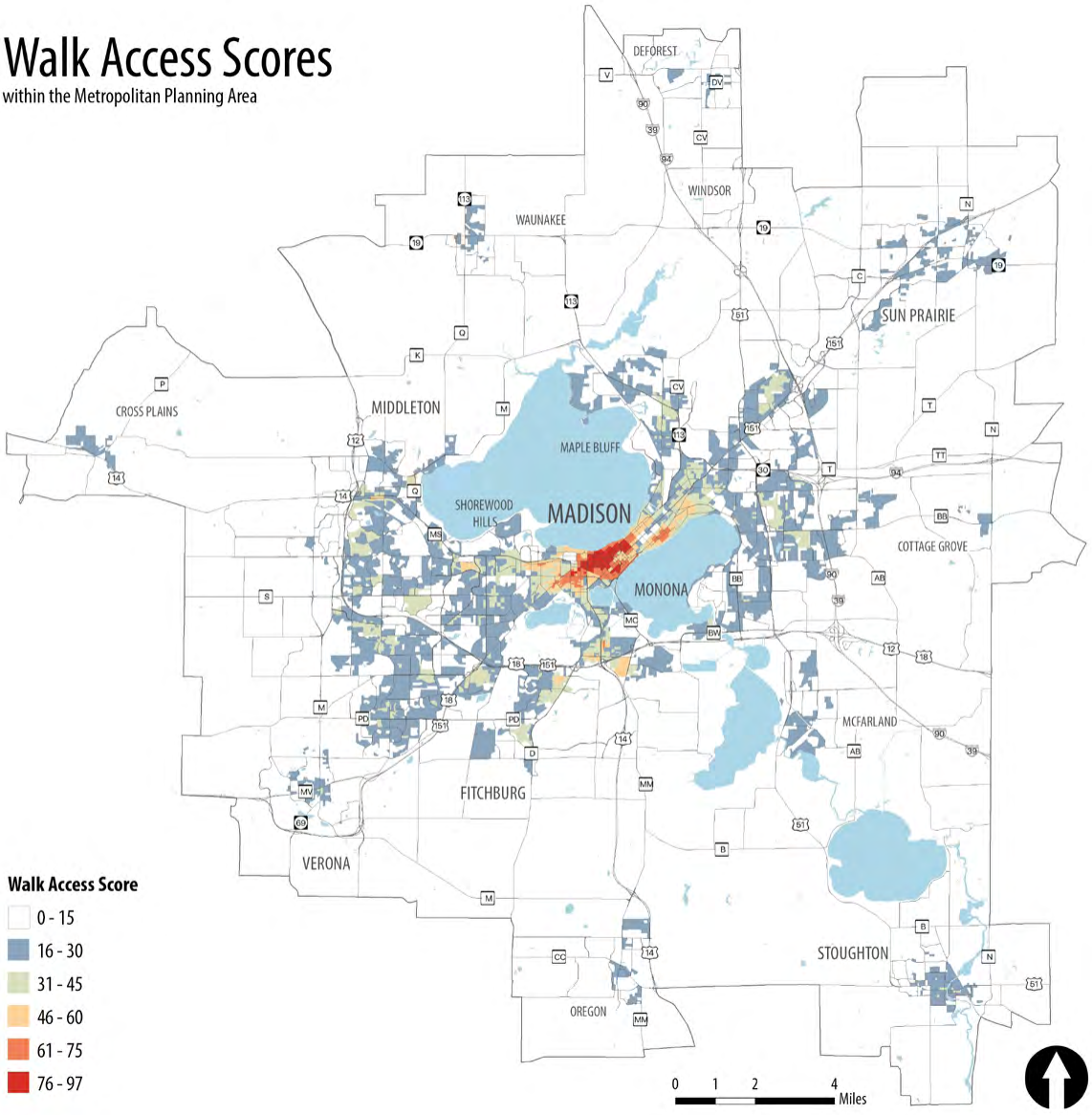


Figure 3-19: Walk Access Scores

Not surprisingly, the central Madison area, including the UW-Madison campus, generates the highest walk access scores. Other mixed-use neighborhoods like Schenk-Atwood, Dudgeon-Monroe, Regent, South Park Street, and suburban downtowns also receive fairly high scores. Many urban neighborhoods have moderate walk access scores, and these areas have regular pedestrian traffic and may have missing connections or substandard facilities.

Street Network Connectivity

Besides high quality pedestrian facilities, pedestrians need a dense network of streets. Since people only walk at a speed of a few miles per hour, any out-of-direction travel is an impediment to walking. Downtown and older neighborhood grid systems with short blocks and dense street networks are ideal for walking.

Intersection density is a key indicator of pedestrian network connectivity. Generally, a higher number of intersections is correlated with shorter blocks and easier navigation. Linear barriers, such as water features, freeways, and railroads also present impediments to walking. Intersection density and linear barriers are shown in Figure 3-20.

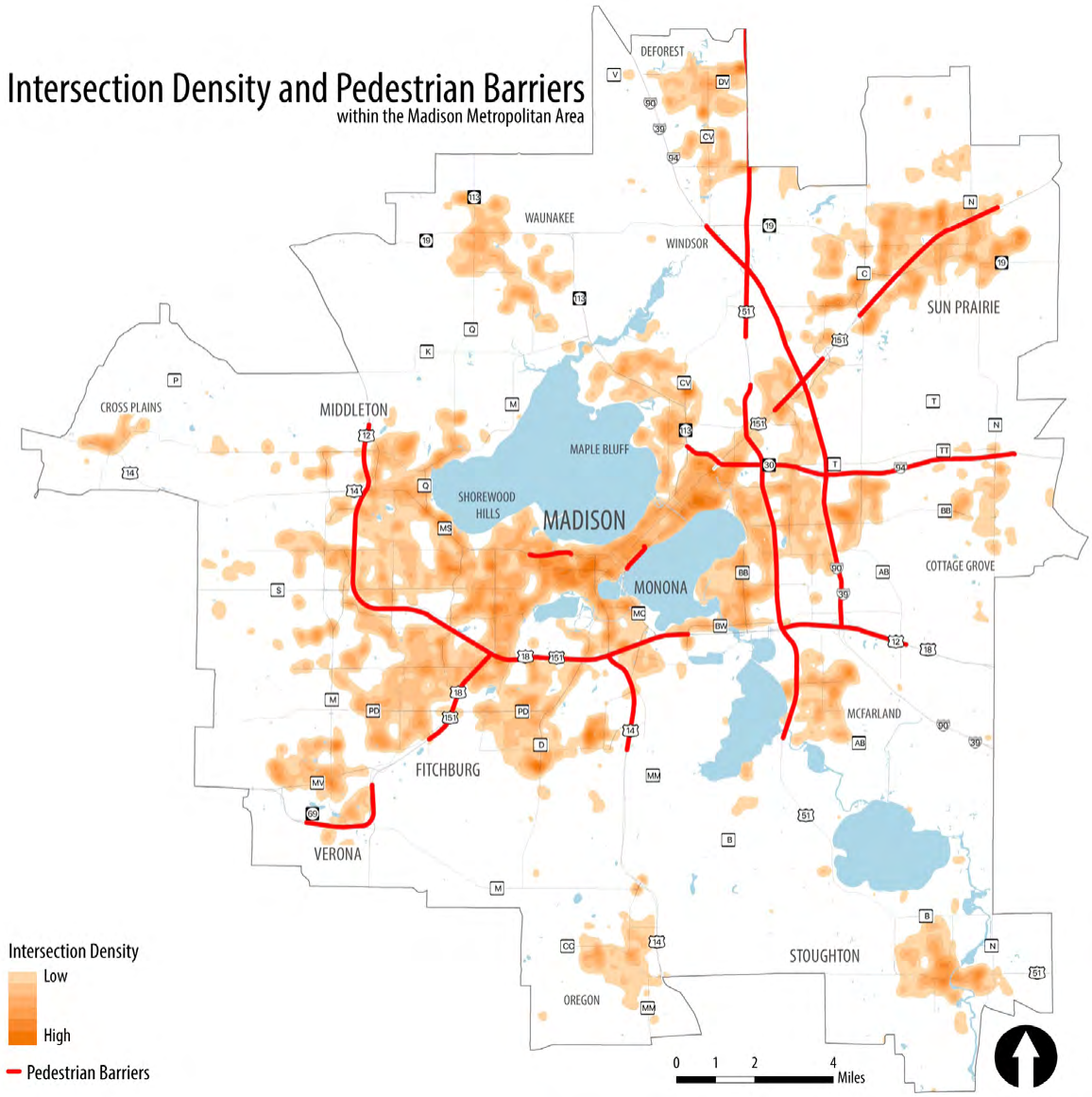


Figure 3-20: Intersection Density and Pedestrian Barriers

The Beltline Highway and Interstate 39/90/94 present significant challenges for connecting neighborhoods. New pedestrian connections across these regional roadways, like new non-interchange crossings, are needed and existing connections may be improved by adding or widening sidewalks and improving intersection crossings at ramp terminals.

All rail lines in the urban area are low volume,low speed lines with relatively frequent crossings. Several rivers and creeks cross the urban area but numerous bridges help to reduce their impact on pedestrian connectivity. For example, the Yahara River contains nine pedestrian crossings in its one-mile stretch between Lakes Mendota and Monona. The City of Madison has identified the need to connect the Capitol Square with Lake Monona with a better crossing of John Nolen Drive and the railroad.

PUBLIC TRANSIT

Service Providers

Metro Transit is operated by the City of Madison and provides the majority of public transportation service in the Madison metropolitan area. Metro operates a fleet of about 215 fixed-route buses as well as point-to-point paratransit service for qualifying people with disabilities. Metro partners with the Cities of Middleton and Fitchburg as well as the University of Wisconsin and other municipalities and entities to provide service outside the City of Madison.

Metro Transit has had an overall trend of increasing ridership since the City of Madison acquired the Madison Bus Company in 1970 as shown in Figure 3-22. The US Oil Crisis of the 1970s caused transit ridership to spike across the nation. Throughout the 1980s ridership declined before reaching a period of moderate growth in the 1990s and fast growth in 2000s. Annual ridership first exceeded 14 million in 2011 and increased further in 2014. Ridership declined in 2015 and 2016. The causes of this recent decline are not entirely clear but may be linked to declining gasoline prices.

In addition to Metro Transit, the City of Monona provides fixed-route commuter service during the morning and afternoon peak periods, called Monona Express, and specialized transportation for seniors and people with disabilities in the mid-day called Monona Lift. Monona Express operates in a counter-clockwise loop around Lake Monona in the morning and a clockwise loop in the evening. Service is only provided to passengers travelling within Monona or between Monona and Madison. Publicly subsidized shared-ride taxi service is available in Sun Prairie and Stoughton.

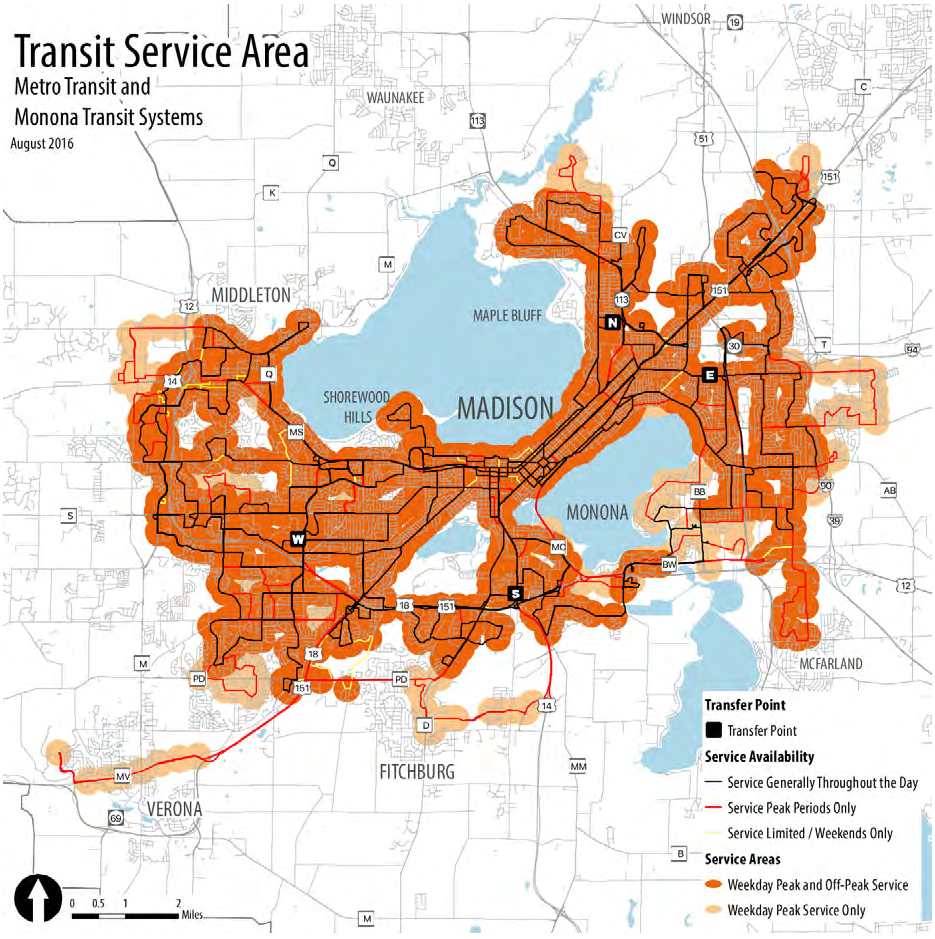


Figure 3-21: Transit Service Areas

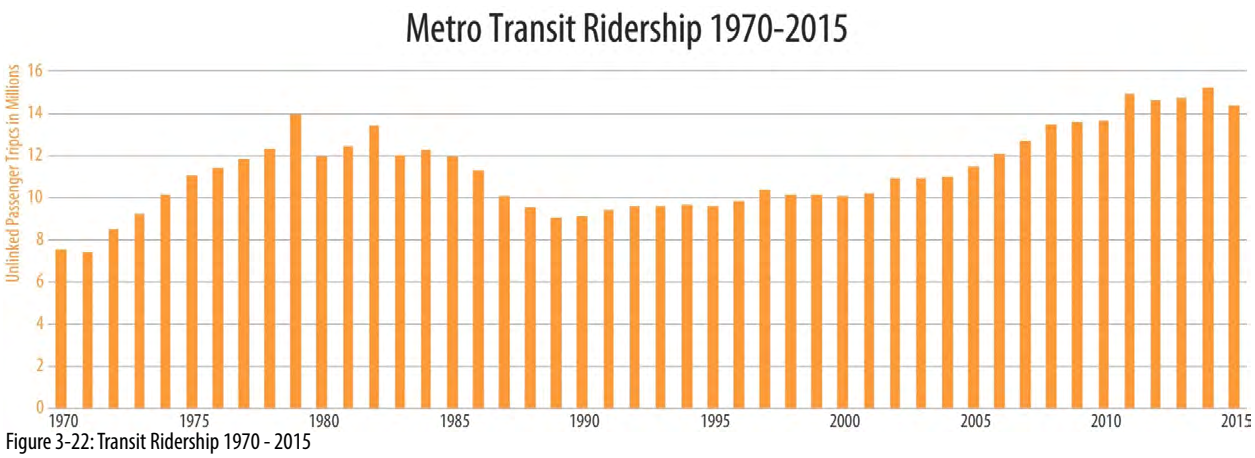


Figure 3-22: Transit Ridership 1970 - 2015

Service Levels

Metro Transit operates 62 mainline fixed routes and several supplemental school day routes based out of Madison's four public high schools. Service is designed around four transfer points with most routes operating every 30 minutes during weekday peak periods and every 30 to 60 minutes off peak if service is offered during those times. Timed transfers at the transfer points allow for efficient connections throughout Metro's service area. Many routes overlap in central Madison to provide service every 15 minutes or better.

Metro Transit's service is concentrated in the morning and afternoon peak periods with about 180 buses in operation during those times. Fleet utilization drops to about 60 buses during the weekday mid day and 35 on weekends. The added service during peak periods consists of increased frequency on all-day routes, commuter routes that provide faster, more direct service and supplemental school day routes targeting middle school and high school students.

Bus Operations

Metro Transit dispatches its fleet of about 215 buses and 17 paratransit vans from a single bus storage and operations facility on East Washington Avenue at Ingersoll Street. The facility was renovated in 1981 with the intent of housing a fleet of about 160 buses and is currently operating beyond capacity. Buses are parked in drive aisles and maintenance bays overnight and Metro leases a small lot in Middleton. Service expansion during peak periods is currently not possible because of the lack of available buses during peak periods.

Metro Transit applied unsuccessfully for a Federal TIGER grant in 2015 and 2016 for funding assistance for a new satellite bus storage and maintenance facility in northeast Madison on Nakoosa Trail. The

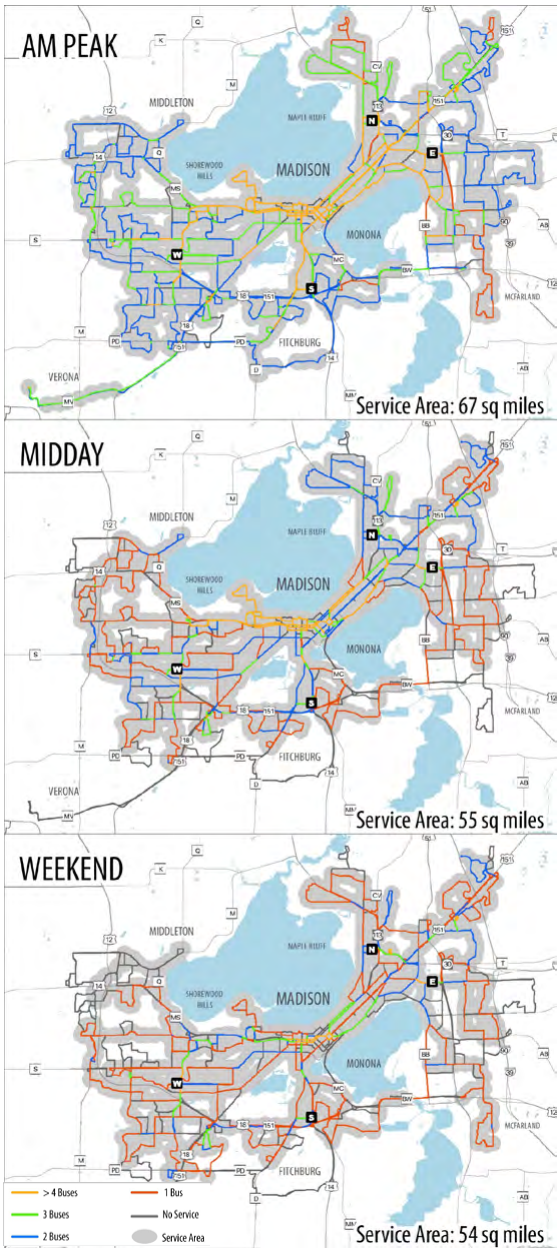


Figure 3-23: Transit Service Areas

new facility would reduce bus crowding at the existing facility and provide space for expansion, allowing Metro to provide new service including bus rapid transit. The Nakoosa Trail facility is planned to be LEED-certified and include a fitness room intended to reduce healthcare costs for bus operators and other employees.

Metro Transit's fixed-route fleet consists entirely of standard-length 40-foot diesel transit buses, about 10% of which are hybrid diesel-electric. Metro Transit, in coordination with MATPB, conducted a Bus Size Study in 2014, reviewing the fleet make-up. The study concluded that although the uniform fleet cost-effectively serves the area, the overcrowding problems encountered on several routes could be solved with larger 60-foot long articulated buses. Further, a few buses could be replaced with shorter 30-foot buses, although the small number of 30-foot buses combined with similar operating costs would not result in large cost savings.



Funding

Funding for public transportation in the Madison area is derived primarily from four sources – fares, property taxes, federal grants, and state operating grants. As Metro Transit is a City of Madison utility, some service, particularly service provided outside the city limits, is funded through partner agreements where other municipalities or institutions cover the local share of the service.

Metro Transit's funding and governance structure as a city-owned utility is fairly uncommon. A Regional Transit Authority which would raise revenue in the transit service area has been explored but is not currently allowed by state law. Enabling legislation was granted in 2009 and rescinded in 2010.

For more information on transit service in the Madison area, see the 2013-2017 Transit Development Plan for the Madison Urban Area prepared by MATPB in cooperation with Metro Transit and other transit providers.

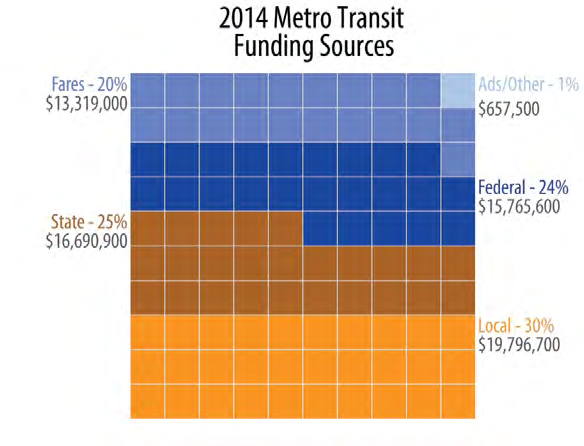


Figure 3-24: 2014 Metro Transit Funding Sources

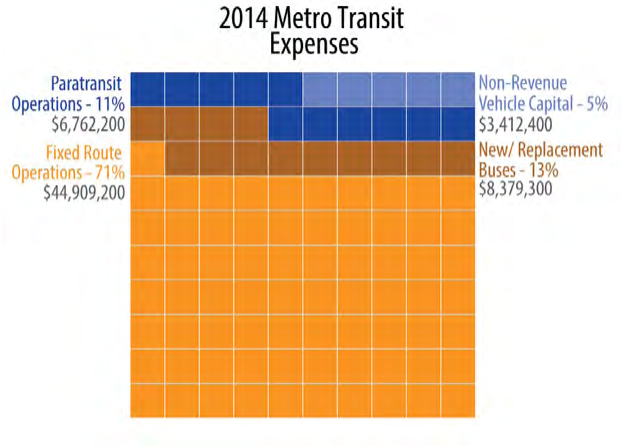


Figure 3-25: 2014 Metro Transit Expenses

Specialized Transit Service Providers

The majority of specialized transit open to the public is supported by Metro Transit and Dane County. A variety of private organizations and service providers help bring the service to the public.



Metro Transit provides its paratransit service, Metro+Plus, in accordance with the Americans with Disabilities Act (ADA). The paratransit network shadows the all-day fixed-route bus system, excluding peak-period commute-oriented service. Paratransit service is provided on a demand-responsive, advance-reservation basis for people who are unable to use Metro's regular fixed-route service.

Metro operates its own paratransit service on weekdays. Late-night and weekend service, as well as weekday service beyond the limitations of the directly operated service, is contracted to private providers. Metro coordinated about 274,000 paratransit trips in 2015 (52,000 directly operated and 222,000 contracted).

The Adult Community Services Division of the Dane County Department of Human Services (DCDHS) administers wheelchair-accessible fixed-route group ride and demand-responsive services for seniors and people with physical or developmental disabilities. The services are provided entirely through contracts with private service providers. DCDHS operates an on-call center to help coordinate these services as well as external resources and to help riders easily connect with the correct service.

The group ride services are divided into Group Access Service, in urban neighborhoods, and the Rural Senior Group Transportation Program, which operates outside of the Madison contiguous area. The services provide regularly scheduled weekday routed group trips for seniors (age 60 and older) and people with disabilities who live at home in Dane County. The service is neighborhood-based, connecting residential areas to nearby nutrition sites, grocery/general shopping areas, and other destinations.

The public shared-ride taxi systems in Sun Prairie and Stoughton offer accessible service that is generally door-to-door. Several private taxi companies operate in the contiguous Madison area; however, only Union Cab offers wheelchair-accessible service.

Other specialized transportation services fill various needs. The Retired Senior Volunteer Driver Escort Program (RSVP) provides individual door-through-door rides primarily to medical appointments for adults aged 60 and over, and for people with disabilities, with volunteer drivers in their own vehicles. The Veterans Helping Veterans program provides veterans and their family members with rides to appointments and services.

For more information on specialized transit services and service needs and coordination issues, see the Dane County Coordinated Public Transit – Human Services Transportation Plan (2013), prepared by MATPB in cooperation with Metro Transit, DCDHS, and other service providers.

TRAVEL DEMAND MANAGEMENT AND RIDESHARING

Travel Demand Management

Travel Demand Management (TDM) is generally defined as a set of strategies designed to reduce roadway congestion and demand for single-occupancy vehicle (SOV) travel by redistributing travel demand to alternative travel modes, times, and routes. TDM programs have typically focused on commuter-based programs such as carpooling, van-pooling, transit, telework, and employer-focused incentive and marketing efforts aimed at reducing SOV trips. TDM programs are now also focusing on active transportation and trips beyond work commutes.

In the Madison metro area, a number of programs and strategies are employed to offer options to commuters. These include the Rideshare, Etc. program, the state-run vanpool program, park and ride lots, public transportation services such as buses, vans and shared-ride taxis, shared vehicles, bicycling, and walking. In addition, strategies to encourage the use of these programs such as the Guaranteed Ride Home program, employer transit pass programs, and promotion programs are also in place.

Rideshare, Etc Program

MATPB administers the Rideshare, Etc program in partnership with WisDOT. The program serves commuters in all of Wisconsin along with the counties in neighboring states. The goal of the program is to reduce congestion and pollution, to provide commuters with more travel options, and to improve quality of life in the communities served. The program includes a website (www.rideshareetc.org) where commuters set up a profile and then can tailor a search to their needs, including a search of potential carpool partners, vanpools, transit routes, and biking partners.

Year	New Commuters Registered
2012	907
2013	919
2014	792
2015	703
2016	676

Figure 3-22: Rideshare Etc. Registrations

As shown in Figure 3-22 in 2016, 676 new commuters registered with Rideshare, Etc for the Dane County area. The number fluctuates each year and the number of registrations is often impacted by the addition of new incentives as well as by rising or decreasing gas prices. However, the total number of commuters in the Madison Metro Area active in the Rideshare, Etc. program is much larger, as many people remain in the system after their initial registration. In 2016 there were 1,866 active participants. In addition, ridesharing arrangements are often formed outside the formal Rideshare, Etc. program and are not captured in these statistics. According to recent Census data, around 8.4% of Dane County residents carpool to work.

State Vanpool Program

Madison is served by a number of vanpools operated by the Wisconsin Department of Administration. The State Vanpool Program serves both state and non-state employees commuting to Madison from outside communities, although each vanpool must have at least one state employee. The vanpools are groups of 7 to 15 commuters traveling together in a passenger van owned and insured by the State Vanpool Program. Passengers share the cost of the trip and pay a fare based on the costs to operate the van. The fare covers gas, insurance and van maintenance. Currently the state operates 70 vanpools commuting to Madison with 920 passengers.



Park and Ride Lots

Currently there are twelve formal park and ride lots in Dane County. Nine are operated by WisDOT, one is jointly operated by WisDOT, Wisconsin Department of Natural Resources and Dane County and two are operated by Metro Transit. Of the park and ride lots, five have transit service:

- North Transfer Point at 1213 Huxley Street
- Dutch Mill Park and Ride on US Highway 51 at US Highway 12/18
- Northside Town Center at Sherman Avenue and Northport Drive
- Verona at 2565 Old County Highway PB
- American Center on East Park Boulevard

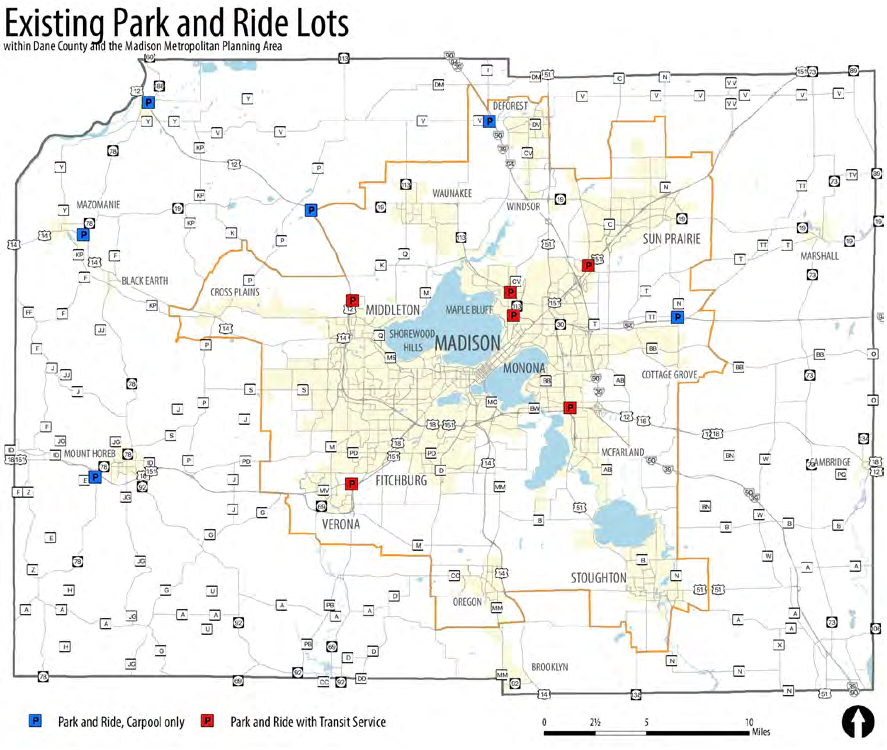


Figure 3-26: Park and Rides

YW Transit & Job Ride Program

YW Transit is a transportation program run by the YWCA that serves Dane County. The three primary goals of the service are as follows:

- Provide rides for low-income people going to/from work
- Provide a safe ride at night for potential victims of sexual assault
- Provide rides to community agency programs for individuals isolated by poverty, age, disability, and language barriers who have no viable transportation options



Source: YWCA

Car Share

Car sharing allows people to access a car for short periods of time, often by the hour. Car sharing makes it easier for people to get by with fewer cars or go car-free, helping members save money while still having access to a car when they need one. Car sharing also provides members with flexibility, since they can access different types of vehicles depending on need. In Madison, car sharing is currently provided by Zip Car. Currently there are 22 Zip Car locations with 32 vehicles which are located on the UW-Madison campus and in the central part of Madison. In the last 12 months the UW-Madison averaged 3,084 members and members used the vehicles for 24,172 hours.

zipcar wheels when you want them

Bike Share



Users of bike share are able to check out a bike at any station, ride to where they need to go, and park the bicycle at the closest station to their destination. People use the bikes to run errands, grab lunch, travel from the bus stop to their office, or just explore the city. The goal is to make it easier for people to make short trips by bicycle.

The City of Madison partners with Trek Bicycles to operate bicycle-sharing through the BCycle program. Currently BCycle operates 40 stations throughout the city with more than 350 bikes. BCycle started with stations primarily on the UW campus and downtown but has been expanding to new areas including stations at Hilldale Shopping Center and Madison College. Many local businesses also partner with BCycle to offer free or low-cost memberships for employees and customers. In 2016 riders took around 101,000 trips covering nearly 308,000 miles and the system averaged just under 300 bike checkouts per day of operation between March 17 and December 31.

Incentive Programs

The Madison area has programs to incentivize commuters to travel by non-SOV modes that are available to all employees. In addition, some businesses have their own incentive systems.

The Guaranteed Ride Home Program supports commuters that do not drive alone to work by providing them with a taxi voucher so they are not stranded at work if an emergency arises. Participants receive up to six vouchers per year good for up to $75 per ride. The program is administered by MATPB and funded by Dane County Highway and Transportation Department. Currently 1,027 people are registered for the Guaranteed Ride Home program.

Metro Transit offers a Commute Card program that is open to employers of any size and offers a reduced price per ride to encourage commuting by bus. The employer can choose to pay the entire cost, share the cost, or have each employee pay for their own rides. Currently 121 employers participate in the program. Large employers such as UW-Madison, City of Madison, Dane County, Edgewood College UW Hospital, Meriter Hospital and St. Mary's Hospital subsidize all or most of the expenses of the Commute Card program for their employees. In addition, a few smaller employers such as Filament Game and the Edgewater Hotel cover the cost of their employees' passes.

Encouragement Programs

To ensure that people are aware of their transportation options and to increase the use of new walking and cycling infrastructure, transit and other services, TDM programs rely on encouragement and education campaigns.

Each year MATPB collaborates with Metro Transit, UW-Madison Transportation Services, and Dane County to run an advertising campaign aimed at raising awareness of commuter options. The campaign usually includes a mix of bus tail ads, online ads, print ads and occasional radio ads.

In addition, Rideshare, Etc. partners with businesses to do outreach through participation in resource fairs and other workplace events as well as providing maps, brochures and other information for businesses to share. Rideshare, Etc. also works with

Sustain Dane to support businesses enrolled in the MPower sustainability program to include TDM projects as a part of their sustainability efforts.

A number of efforts in the Madison area are also focused specifically on promoting bicycling. Many communities participate in the Wisconsin Bicycle Federation-sponsored Bike Week which is held annually in June, and is an expansion of the traditional Bike to Work Day.



One of the newest bicycle promotion programs is the Love to Ride Madison bicycle challenge. This month-long challenge provides messaging tailored to a person's riding experience and encourages experienced bicyclists to get their co-workers and friends out on rides. The ultimate goal of the month-long challenge is to get more people to bike to work and school. The behavior change model recognizes that people are not likely to go straight from never riding a bike to riding one to work. Instead, they are likely to begin with a recreational trip on the weekend and then, once they get comfortable on a bike, move on to cycling on an easy errand before they try commuting to work.



In addition, the Safe Routes to School movement focuses on getting parents and children to walk and bike to school, as children being driven to school creates congestion and safety concerns. Safe Routes to School programs exist in schools throughout Dane County to promote walking and bicycling to and from school. Starting in 2017 a coordinated county-wide program will begin with Federal Transportation Alternatives Program funding provided by MATPB.

UW-Madison Commuter Solutions Program

UW-Madison has a comprehensive TDM program, with a staff that includes a Program Manager, a Ped/Bike Coordinator, and a Flex Parking/Transit Coordinator. The UW Commuter Solutions program UW-Madison TDM activities include:

- Promoting Transit: UW-Madison provides free campus bus service and contracts with Metro Transit to provide a Commute Card for both faculty/staff and students.
- Supporting Carpooling: The UW offers 6 daily parking passes at no cost for registered carpool members as an added incentive.
- Park and Ride: The UW offers park and ride lots for faculty and staff including one at Wingra Dr. and one at University Crossing that have a shuttle to campus. The UW also has a park and ride lot at University Research Park that is served by Metro Transit.
- Occasional Parking for non-SOV commuters: The Flex Parking program provides occasional parking to people who normally commute by alternate modes.
- Supporting Bicycling: The UW provides bicycle parking throughout campus, with bike lockers and cages for more secure parking. The UW also runs a Bicycle Resource Center that offers free use of tools and classes on maintenance and repair for students and employees.

INTER-REGIONAL TRAVEL

Inter-City Bus Service

A handful of private inter-city bus companies provide regularly-scheduled bus service between Madison and Milwaukee, Chicago, and other cities, as well as points in between. Badger Bus provides eight round trips per day to Milwaukee with stops in Johnson Creek and Waukesha, and Van Galder provides more than 12 round trips daily to Chicago with stops in Janesville, Beloit, and Rockford. Megabus and Greyhound provide several daily express trips to Chicago and the Twin Cities.

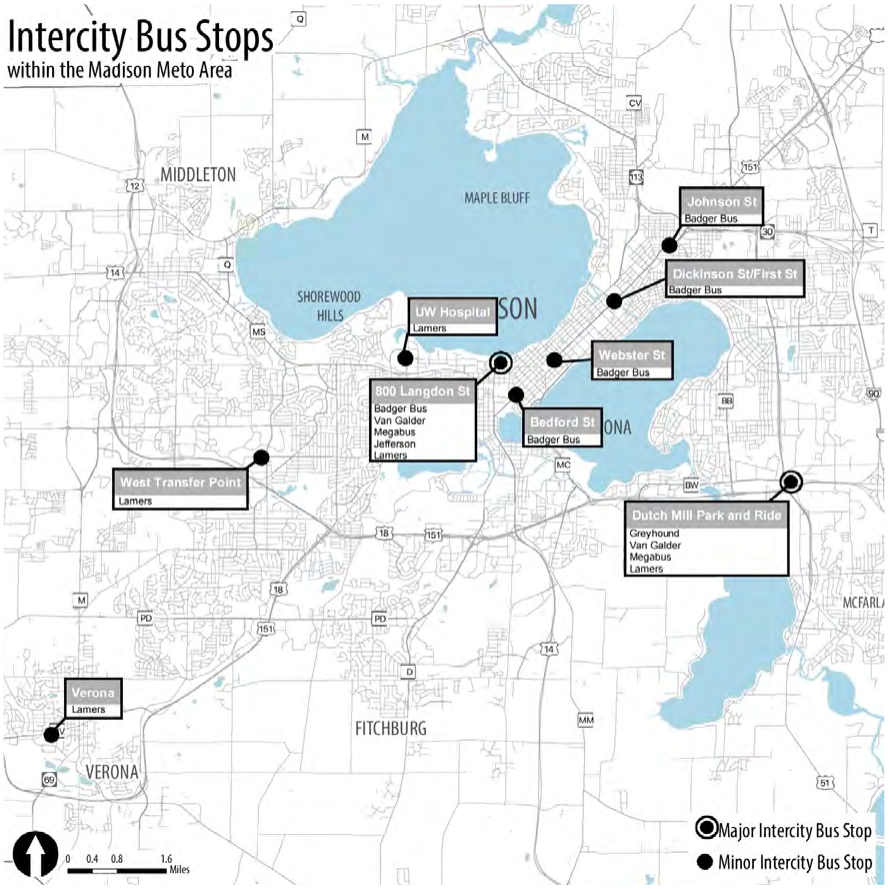


Figure 3-27: Intercity Bus Stops

Lower-volume routes connect Madison to smaller cities. Lamers Bus Lines runs three daily routes between Madison and Dubuque, Green Bay, and Wisconsin Rapids. Jefferson Lines also links Madison to La Crosse on its Milwaukee to Minneapolis route. This service is partially supported by Wisconsin state intercity bus grants. In addition, seasonal limited service between Madison and Whitewater, Eau Claire, and La Crosse/Minneapolis operated by Badger Bus supports college and university student weekend travel.

Passenger Rail Service

The nearest passenger rail station with regular public service is in Columbus, Wisconsin, about 26 miles northeast of downtown Madison. This station serves Amtrak's daily Empire Builder route serving Chicago, Milwaukee, Minneapolis/St Paul, Seattle, Portland, and other cities.



Amtrak also coordinates with inter-regional bus companies to sell integrated tickets on their thruway bus service. Thruway bus service allows passengers to buy a single ticket that includes travel on Amtrak's rail service and connecting bus routes. Amtrak's national network includes a central hub in Chicago which, along

with Van Galder's Madison-to-Chicago bus service, allows convenient rail travel between Madison and many major destinations around the U.S.

Besides its long-distance service, with trains generally running daily on routes longer than 750 miles, Amtrak offers more frequent service on shorter state-supported lines. The Hiawatha Service between Chicago and Milwaukee is one of Amtrak's more successful state-supported routes with about seven daily round trips and about 800,000 passenger boardings per year. Planned improvements to the Hiawatha Service include improving frequency to ten round trips per day and increasing train speeds to 90 miles per hour. In the 2000s, the Wisconsin Department of Transportation led an effort to extend the Hiawatha Service line to Madison with improved tracks and a station near the Monona Terrace. The project was canceled in 2010.

Inter-City Bus Terminal

Inter-city buses stop in a variety of places in Madison but most serve a stop on Langdon Street on the UW campus (See Figure 3-27). Greyhound is an exception, only serving the Dutch Mill park-and-ride on Madison's southeast side. No terminal serves inter-city bus passengers – leaving them without access to bathrooms, information, or shelter. The lack of an inter-city transit terminal is inconsistent with the level of inter-city bus service in Madison. The need for a new terminal has been felt at least since Badger Bus closed their terminal on Bedford Street in 2009, and was exacerbated when inter-regional buses could no longer stop on Langdon Street due to a renovation of the Memorial Union. The stop has since moved back to Langdon Street; however, the stop is now near Lake Street, rather than in front of the UW Memorial Union.



Various sites for an inter-city terminal have been investigated, including a rail terminal near the Monona Terrace, a parcel on Bedford Street, and a terminal integrated into the Lake Street parking garage when it is reconstructed. There is general agreement on the need to provide a high quality facility that serves all the inter-city bus lines with information, ticket sales, and other amenities in a location with convenient pedestrian access to the UW, Capitol Square, and Metro Transit bus service.

Airport Access

Metro Transit provides public transit service to the Dane County airport, with Route 20 operating every 30-60 minutes between the North Transfer Point and East Towne Mall. Transfers at either location allow passengers to travel to central Madison, the UW, and other destinations in the Metro Transit service area. A trip between the Capitol Square and the airport, a five-mile trip, is scheduled to take about 31 minutes, including a five- to ten-minute wait at the North Transfer Point.

Direct limited-stop service between central Madison and the Dane County Airport has been investigated intermittently. The region's hesitancy to introduce the service is due to several factors. First, transit ridership from the airport is currently estimated at only 15 to 20 passengers per day. Although it is unclear what the demand potential would be with faster, simpler service, it is unlikely that a fixed-route service designed specifically to serve the airport could be operated with sufficient frequency to draw enough ridership and be a cost-effective use of funds. Second, the service would be duplicative of parallel service in the corridor, particularly routes 20 and 2 and/or 4.

The planned Bus Rapid Transit system includes a line along Sherman Avenue serving the North Transfer Point and Northside Town Center with some trips continuing east to the airport. This service would provide a fast trip between the airport and central Madison without a transfer.

FREIGHT

Freight Movement



The region's economic prosperity depends on the efficient movement of goods. Freight plays an important role in business efficiency, productivity, and profitability. In fact, reports show there is a strong correlation between an increase in the movement of freight and growth in gross domestic product.

In recent years, a shift towards online shopping from traditional brick-and-motor stores has had a major impact on the amount and types of freight shipments entering the community and fundamentally changed the "last mile" of freight movements. In the past, the "last mile" movement of a freight delivery was to a retail store, whereas now a number of these movements terminate at an individual address in a residential neighborhood.



Over the last few years in Dane County, freight volumes have been increasing, with trucks carrying more of these shipments. In 2007, Dane County received over 8 million tons of freight, about 1 million tons of which was carried by rail, with nearly all of the remainder carried by truck. Air and other modes (such as pipelines) carried only a very small portion of total inbound freight. At the same time over 8 million tons of freight left the region, with virtually all of it leaving via trucks. By 2014, inbound shipments had increased by over 45 percent and outbound shipments by about 9 percent. Of the nearly 12 million tons of inbound freight, nearly 11.5 million tons arrived by truck, while only 400,000 arrived by rail.

Figure 3-28

Dane County Freight Flows (2014)

	Rail Tons	Truck Tons	Air Tons	Other Tons	Total Tons	Rail Value	Truck Value	Air Value	Other Value	Total Value
Outbound	93,808	8,950,409	12,953	78	9,057,248	$57,318,279	$8,598,129,851	$844,223,852	$3,284,361	$9,502,956,343
Inbound	402,772	11,494,628	13,013	83	11,910,497	$240,770,009	$11,828,391,105	$804,907,825	$1,314,921	$12,875,383,860
Internal	3,600	2,689,808	0	0	2,693,408	$2,067,151	$1,712,152,252	$0	$0	$1,714,219,403
Totals	500,180	23,134,845	25,966	161	23,661,153	$300,155,438	$22,138,673,208	$1,649,131,677	$4,599,282	$24,092,559,606

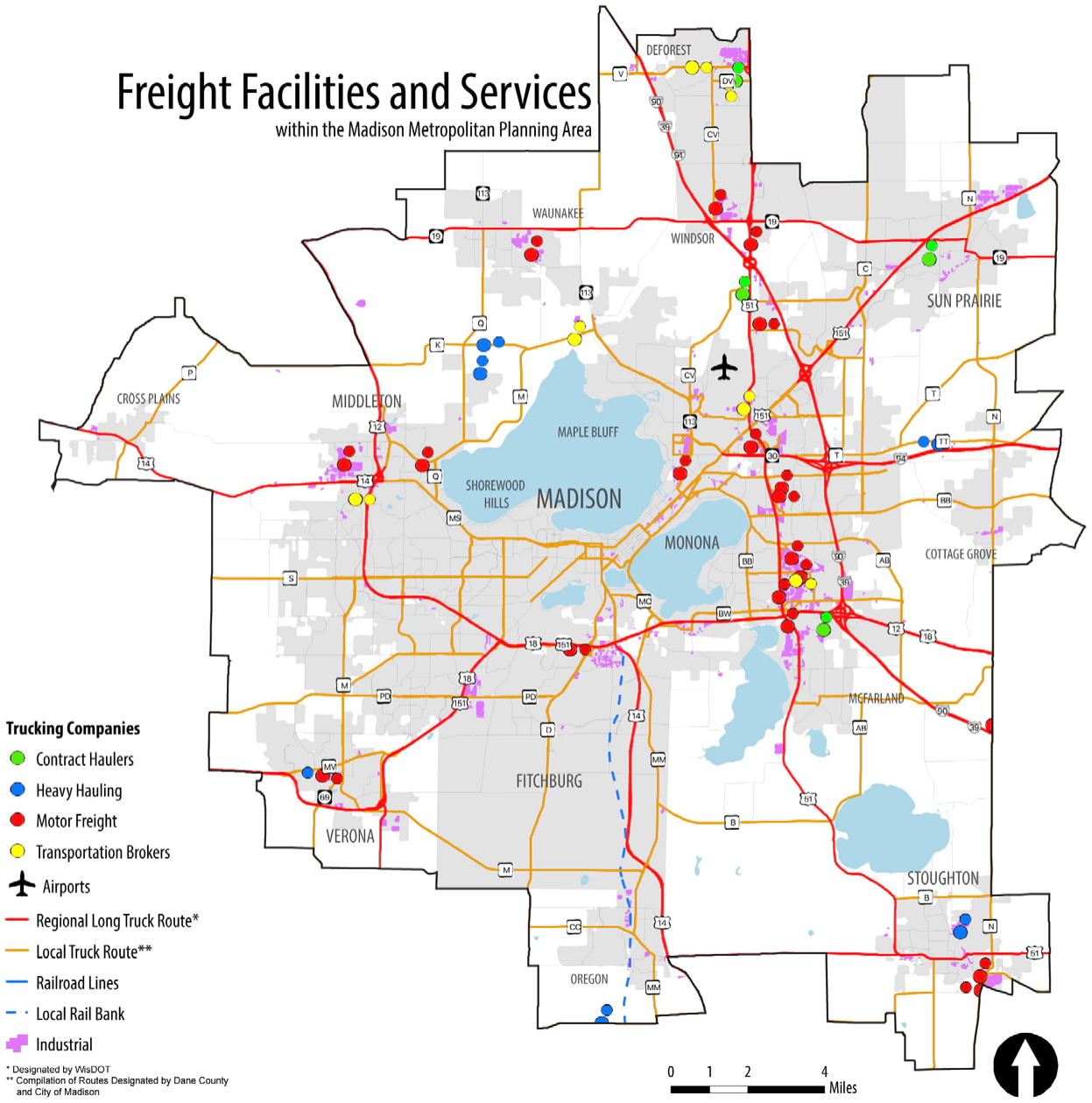


Figure 3-29: Freight Facilities and Services

Between 2007 and 2014 there was a marked increase in the amount of freight arriving by air. This is significant because air freight is dominated by high-value materials, as shown by the very high value of these shipments relative to their weight (Figure 3-28).

The total value of freight shipments, both inbound and outbound, was over $24 billion dollars in 2014. Inbound shipments had a total value of nearly $13 billion, outbound $9.5 billion, and the remainder were internal shipments. Over 90% of the total value of freight shipments was transported by truck.

Figure 3-30

Weight and Value by Mode (2014)

Mode	Tons	% of Total	Value	% of Total
Truck	23,134,845	97.8%	$22,138,673,208	91.9%
Rail	500,180	2.1%	$300,155,438	1.2%
Air	25,966	0.1%	$1,649,131,677	6.8%
Unknown	161	0.0%	$4,599,282	0.0%
Total	23,661,153	100.0%	$24,092,559,606	100.0%

Figure 3-31

Dane County Freight Tonnage by Mode (2014)

	Outbound Freight					Inbound Freight					Internal Freight	
Mode	Within WI	Outside WI	Total	% Within WI	% Outside WI	Within WI	Outside WI	Total	% Within WI	% Outside WI	Total	% of Total
Truck	5,362,444	3,542,398	8,904,841	60.2%	40%	5,888,514	5,606,114	11,494,628	51.2%	48.8%	2,689,808	99.9%
Rail	16,072	77,736	93,808	17.1%	83%	91,320	311,452	402,772	22.7%	77.3%	3,600	0.1%
Air	3,961	8,993	12,953	30.6%	69%	3,924	9,090	13,013	30.2%	69.8%	0	0.0%
Unknown	0	78	77	0.0%	100%	0	83	83	0.0%	100.0%	0	0.0%
Total	5,382,476	3,629,204	9,011,680	59.7%	40%	5,983,758	5,926,739	11,910,497	50.2%	49.8%	2,693,408	100.%

A slight majority of the freight shipped into Dane County comes from within the state of Wisconsin. Unsurprisingly, most of the rail and air freight shipped into the county comes from outside of the state, while truck freight is evenly distributed between shipments that come from Wisconsin and those coming from outside of the state. Nearly 60 percent of the outbound freight is bound for a destination within the state. Interestingly, Dane County receives four times more inbound than outbound rail tonange, while inbound and outbound air shipment tonnage is nearly identical. Intra-county freight shipments amount to 2.6 million tons, nearly all of which are carried by truck.

The county exports and receives a wide variety of commodities. The top inbound commodities by weight are broken stone or riprap (18%), gravel or sand (10%), and warehouse and distribution center goods (9%). The top outbound commodities by weight are gravel or sand (26%), grain (15%), and broken stone or riprap (10%). Internal freight largely consisted of the same commodities – broken stone or rip rap (37%), gravel or sand (19%), and petroleum refining products (18%).

Freight Facilities

Trucking

As mentioned earlier, a majority of the freight bound for and coming from Dane County is carried by trucks. The Interstate and U.S. highways that pass through the county are statutorally designated as Long Truck Routes – routes that can accommodate vehicles up to 75 feet long. These routes connect the metropolitan area to surrounding cities including La Crosse, Eau Claire, Wausau, the Twin Cities, the Fox Valley Cities, Janesville, Dubuque, Rockford, Milwaukee, and Chicago.



Local truck routes include many major local arterials and business highways within the region such as East Washington Avenue, University Avenue, McKee Road (CTH PD), Milwaukee Street, Reiner/Sprecher Roads, and Monona Drive. These routes are integral for moving freight around the region as well as to and from their local destinations. Local routes are defined by local

Figure 3-32

Dane County Inbound, Outbound, and Internal Commodities, by Tonnage (2014)

Commodity	Inbound		Outbound		Internal		Total	
	Tonnage	%	Tonnage	%	Tonnage	%	Tonnage	%
Gravel or Sand	1,232,524	10.3%	2,325,472	25.7%	521,242	19.4%	4,079,238	17.2%
Broken Stone or Riprap	2,142,057	18.0%	886,314	9.8%	1,004,541	37.3%	4,032,912	17.0%
Grain	587,880	4.9%	1,369,294	15.1%	20,704	0.8%	1,977,878	8.4%
Warehouse & Distribution Center	1,083,034	9.1%	562,369	6.2%	53,009	2.0%	1,698,411	7.2%
Petroleum Refining Products	395,170	3.3%	628,041	6.9%	490,869	18.2%	1,514,080	6.4%
Misc Waste or Scrap	527,726	4.4%	270,043	3.0%	120,199	4.5%	917,968	3.9%
Dairy Farm Products	121,181	1.0%	571,323	6.3%	10,753	0.4%	703,258	3.0%
Ready-mix Concrete, Wet	429,090	3.6%	91,843	1.0%	123,094	4.6%	644,027	2.7%
Misc. Field Crops	346,597	2.9%	120,828	1.3%	9,836	0.4%	477,260	2.0%
Asphalt Paving Blocks or Mix	379,740	3.2%	-	0.0%		0.0%	379,740	1.6%
Concrete Products	269,007	2.3%	33,091	0.4%	16,046	0.6%	318,145	1.3%
Prepared or Canned Feed	86,514	0.7%	204,642	2.3%	8,654	0.3%	299,811	1.3%
Liquefied Gases, Coal or Petroleum	139,806	1.2%	81,558	0.9%	19,362	0.7%	240,725	1.0%
Cut Stone or Stone Products	80,625	0.7%	106,459	1.2%	37,650	1.4%	224,734	0.9%
Bread or Other Bakery Prod	54,128	0.5%	119,521	1.3%	25,459	0.9%	199,108	0.8%
Livestock	147,116	1.2%	28,788	0.3%	1,212	0.0%	177,116	0.7%
Misc Plastic Products	64,879	0.5%	100,122	1.1%	5,192	0.2%	170,193	0.7%
Oil Kernels, Nuts or Seeds	42,059	0.4%	116,061	1.3%	2,057	0.1%	160,177	0.7%
Soft Drinks or Mineral Water	155,238	1.3%	-	0.0%	-	0.0%	155,238	0.7%
Misc Food Preparations, Nec	65,356	0.5%	63,593	0.7%	13,861	0.5%	142,810	0.6%
Primary Iron or Steel Products	139,034	1.2%	-	0.0%	-	0.0%	139,034	0.6%
Truck Trailers	18,855	0.2%	85,278	0.9%	21,978	0.8%	126,111	0.5%
Misc Industrial Organic Chemicals	120,172	1.0%	-	0.0%	-	0.0%	120,172	0.5%
Fertilizers	37,042	0.3%	62,630	0.7%	14,040	0.5%	113,711	0.5%
Misc Metal Work	44,187	0.4%	60,685	0.7%	7,434	0.3%	112,306	0.5%
Lumber or Dimension Stock	111,693	0.9%	-	0.0%	-	0.0%	111,693	0.5%
Portland Cement	86,772	0.7%	8,694	0.1%	15,850	0.6%	111,315	0.5%
Meat Products	17,408	0.1%	77,680	0.9%	8,586	0.3%	103,674	0.4%
Metal Scrap or Tailings	-	0.0%	102,528	1.1%	-	0.0%	102,528	0.4%
Paper Waste or Scrap	978	0.0%	97,512	1.1%	1,022	0.0%	99,512	0.4%
Flour or Other Grain Mill Products	98,680	0.8%	-	0.0%	-	0.0%	98,680	0.4%
OTHER	2,885,948	24.2%	882,881	9.7%	140,759	5.2%	3,909,588	16.5%
Total	11,910,497	100%	9,057,248	100%	2,693,408	100.0%	23,661,153	100%

municipalities and Dane County and are shown in orange on the map to the right.

The metropolitan area is home to numerous trucking companies including contract haulers, heavy hauling companies, motor freight companies, and transportation brokers. Most of these companies cluster in industrial areas and near long truck routes. Many truck companies are located along the US Highway 51 corridor due to the corridor's relatively easy access to the Interstate System.

Rail

The Wisconsin and Southern Railroad Company (WSOR) is the principal or sole operator on all of the rail lines in the area except for a segment that runs between Madison and DeForest that is owned by Canadian Pacific. WSOR connects the region with over 21 counties in southern Wisconsin and northern Illinois on its more than 700 miles of track.

Air

The Dane County Regional Airport (MSN) on the north side of Madison provides air cargo service to the region. The most recent major change in cargo operations at the airport occurred in 2010, when FedEx increased service to meet the demands

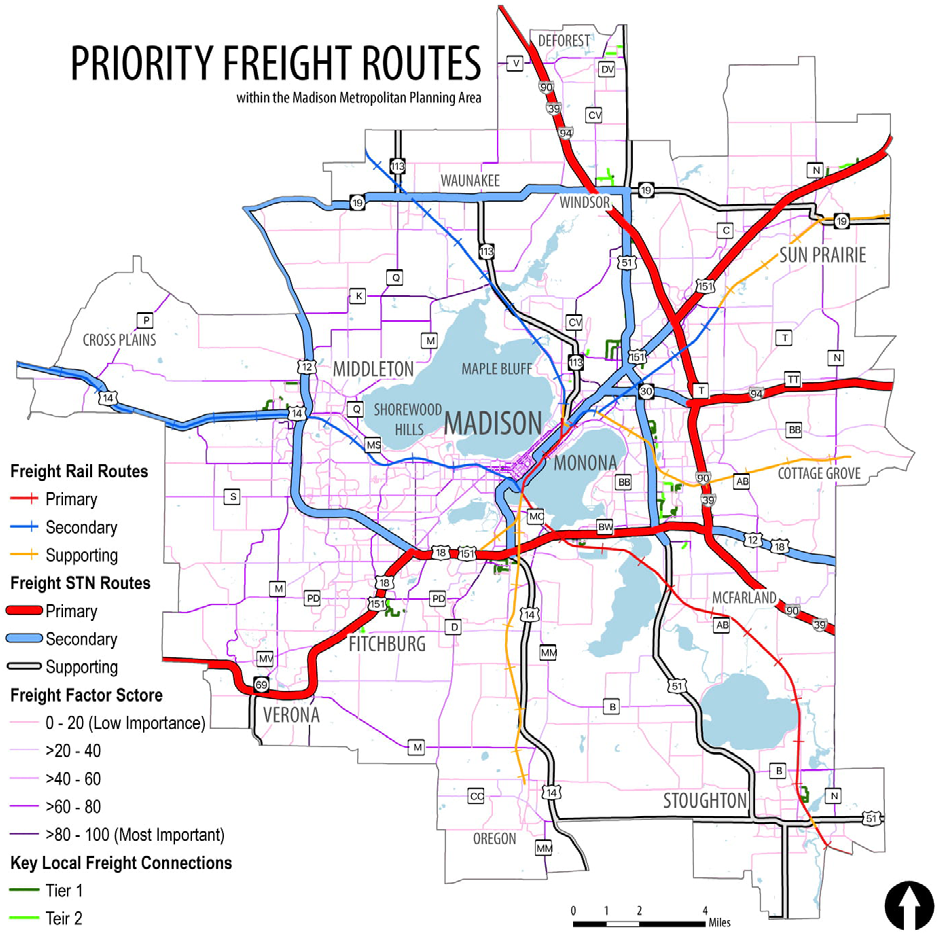


Figure 3-33: Priority Freight Routes





of the recovering economy, following the departure of a competing air cargo operator. Goods shipped by air tend to be high value, low weight, and perishable or otherwise time sensitive. Examples include medical equipment, farm and food products, and medical samples.

Intermodal

Intermodal facilities provide access and service to multiple modes of transportation without any handling of the freight itself while changing modes. There are no intermodal facilities in Dane County.

Priority Freight Routes

WisDOT is finishing up work on the first State Freight Plan. As part of the planning effort, WisDOT examined all freight routes within the state and identified of the most important regional routes, rail lines, and local routes. For local routes, state highways, railroads, ports, and airports WisDOT developed a "freight factor" based on the freight tonnage, value, and connection between modes that a particular route provides. The freight factor of a roadway signifies the importance of a route to the freight network.

The map on the previous page identifies primary, secondary, and supporting rail and state highway network routes. Additionally, it highlights the freight factor of local routes, and key local freight connections.

National Highway Freight Program

Section 1116 of the FAST Act established a new National Highway Freight Program (NHFP) to increase the efficiency of freight movement on the National Highway Freight Network (NHFN), replacing the National Freight Network and Primary Freight Network created under MAP-21. The NHFN is composed of the following road systems:

- Primary Highway Freight System (PHFS)- The most critical highway portions of the US freight transportation system.
- Interstate routes not on the PHFS.
- Critical Urban Freight Corridors (CUFC)- Roads in urbanized areas which provide access and connect the PHFS and interstates with ports, public transportation facilities, or other intermodal transportation facilities. Each state, in consultation with MPOs, may designate up to 75 miles of highway as CUFCs.
- Critical Rural Freight Corridors (CRFC)- Roads not in an urbanized area which provide access and connect the PHFS and interstates with ports, public transportation facilities, or intermodal transportation facilities. Each state may designate up to 150 miles of highway as CRFCs.

The FAST Act requires FHWA to re-designate the PHFS every 5 years to reflect changes in freight flows; states can designate CUFCs and CRFCs on a rolling basis. National Highway Freight Program funds may only be used for projects on the NHFN.

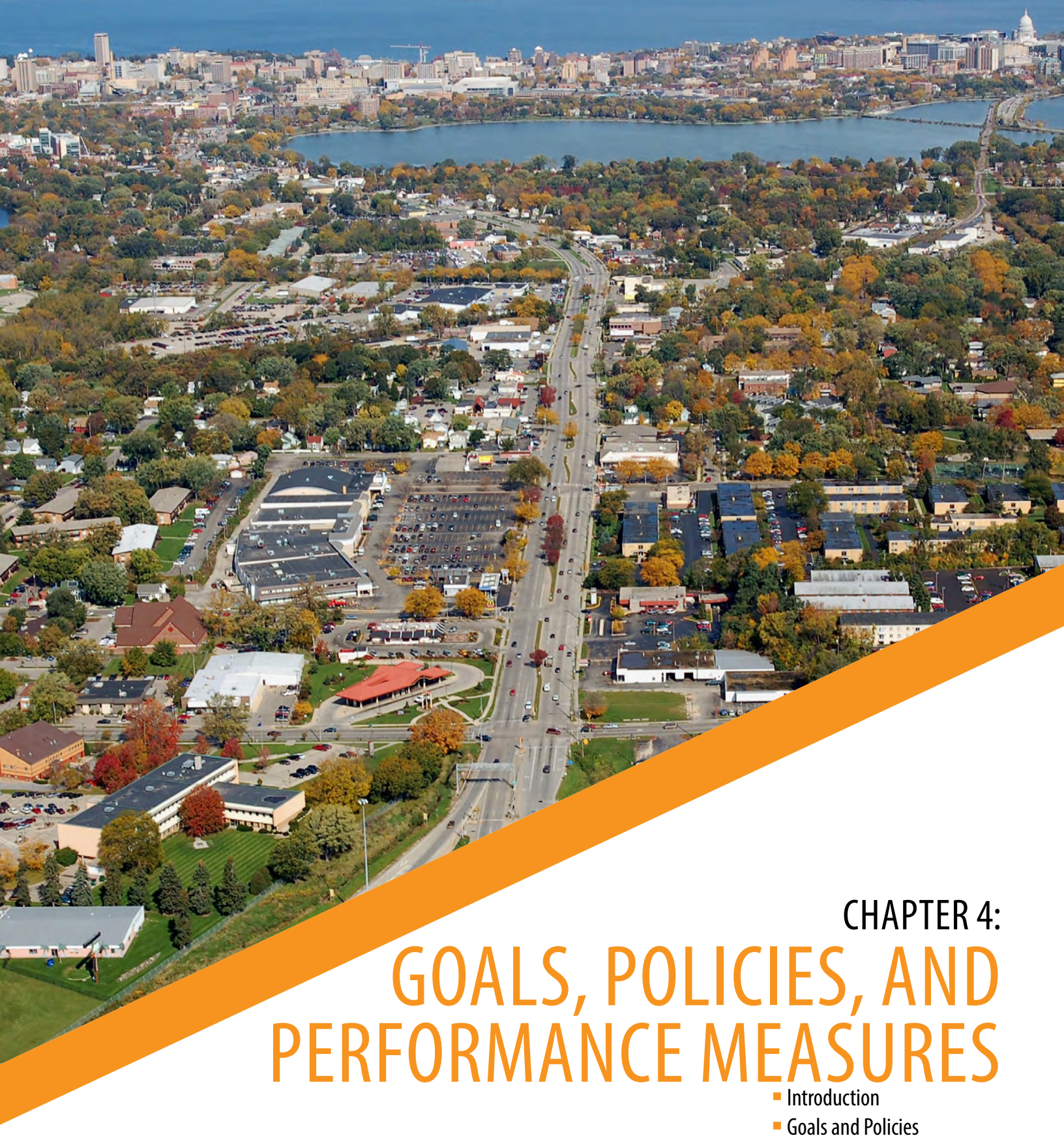
As shown in Figure 3-34, in Dane County Interstates 39, 90, and 94 are included in the PHFS of the NHFN, in addition to approximately 12 miles of the Beltline from Gammon Road to I-39/90.

As part of the draft National Freight Strategic Plan, the U.S. DOT has proposed a draft National Multimodal Freight Network (NMFN) that includes railways, waterways, ports and harbors, pipelines, airports, and intermodal facilities, in addition to highway facilities, that is a more comprehensive collection of the facilities that are critical to the safe and efficient movement of freight throughout the country.





Figure 3-34: National Highway Freight Network in Wisconsin



CHAPTER 4:
GOALS, POLICIES, AND PERFORMANCE MEASURES

- Introduction
- Goals and Policies
- Performance Measures

INTRODUCTION

The Regional Transportation Plan (RTP) goals and policies are based upon the principles of sustainability. Sustainability is defined generally as meeting our current economic, community, and environmental needs without sacrificing the ability of future generations to do the same. Social equity, a healthy environment, and a prosperous economy are described as the "three Es" of sustainability.

Social Equity: The transportation system should be designed to provide an equitable level of services to all segments of the population across all modes.

Environment: The transportation system should be designed and operated within the context of its environment, minimizing negative impacts and fostering efficient development patterns that optimize travel, housing, and employment choices. The system should support existing and planned development and discourage growth in rural areas.

Economy: The transportation system should ensure that businesses have maximum opportunities to serve customers, reach clients, export goods, and obtain workers. The system should play a significant role in raising the region's standard of living and quality of life.



These principles of sustainability are prominently featured and interwoven into a number of the RTP goals and the policies that support those goals.

The RTP goals and policies also build upon the vision and goals developed and approved by the Capital Region Sustainable Communities (CRSC) Consortium, of which MATPB is a member. The CRSC consortium was formed in 2011 to carry out the work of a federal Sustainable Communities Regional Planning Grant. The grant funded a number of projects, including a Bus Rapid Transit feasibility study. In addition to these projects, the Consortium forged agreement on a vision for the region of a "healthy and flourishing place for all" and a related series of broad goals:

- Healthy Ecosystems
- Economic Competitiveness
- Housing Choice
- Efficient, Effective Transportation
- Healthy Food and Farms
- Efficient Utilities and Service
- Vibrant Culture
- Regional Collaboration

Livability

There is no singular definition of the term "livability," as everyone values different aspects of urban living differently. We are using the term to refer to neighborhoods and communities that are walkable and provide transportation choices, good access to jobs and services, affordable housing, quality schools, parks and other public spaces, and safe streets. By design, they are more compact and pedestrian-oriented with a mix of uses in close proximity. They support people of all ages and invest in existing neighborhoods and amenities such as art, cultural heritage, and street and development designs that create a sense of place.



Downtown Waunakee.

Complete Streets

Complete streets are streets that are designed, built, and operated to accommodate safe access for all users including pedestrians, bicyclists, transit riders, and motorists. Complete streets vary between communities because their design is based on their unique context and needs. A complete street in a highly urban environment may include bus lanes, wide sidewalks, bike lanes, median islands, and curb extensions whereas a complete street in a rural environment may have a separated path parallel to a roadway or a wide shoulder.



Downtown Madison.

GOALS AND POLICIES

The development of the Regional Transportation Plan (RTP) 2050 began by developing a set of goals that represent overarching aspirational statements about desired outcomes that the region will work towards achieving. A set of policies was then developed that support each goal. The goals and policies serve as the foundation for the plan. They will guide the selection of the projects included in the plan and the identification of the strategies and recommendations. The goals and policies will also be used by MATPB as the basis for criteria used to select projects identified in the plan for funding with federal transportation funds MATPB receives.

As part of continuing efforts to ensure coordination of regional land use and transportation planning, MATPB has made certain that the policies developed for the RTP, particularly those related to land use development and environmental protection, are consistent with the amended goals and objectives adopted by the Capital Area Regional Planning Commission (CARPC) in 2008 for the regional land use plan.

Goal 1: Create Connected Livable Neighborhoods and Communities

Create interconnected livable places linked to jobs, services, schools, shops, and parks through a multi-modal transportation system that is integrated with the built environment and supports compact development patterns that increase the viability of walking, bicycling, and public transit.

<u>Policies supporting this goal:</u>

1. Coordinate land use, housing, and transportation planning and decision making to foster compact development patterns that provide transportation and affordable, accessible location-efficient housing choices.
2. Promote walkable, mixed-use neighborhoods.
3. Encourage growth in areas of existing development that place jobs, housing, and services closer together.
4. Encourage the concentration of higher density and mixed-use development in activity centers and along major transit corridors.
5. Enhance existing retail and employment centers in transit corridors by adding residential and other complementary land uses and making them more pedestrian friendly.
6. Encourage street oriented, human-scaled development designs that create accessible, vibrant neighborhoods.
7. Build Complete Streets that are safe, convenient, and attractive for everyone, regardless of age, ability, or mode of transportation.
8. Provide a well-connected street network and facilities for walking and bicycling that provide transportation choices and convenient

access to daily activities.

9. Encourage transit-supportive land uses along existing and planned transit routes and use of transit-compatible site and street designs, where appropriate.
10. Utilize context sensitive transportation facility design that is a product of integrated land use and transportation planning and supports community character.

Goal 2: Improve Public Health, Safety, and Security

Design, build, operate, and maintain a transportation system that enables people to get where they need to go safely and that, combined with supportive land use patterns and site design, facilitates and encourages active lifestyles while improving air quality.

Policies supporting this goal:

1. Address the safety and security of all users in planning, designing, building, operating, and maintaining the transportation system.
2. Retrofit existing transportation facilities that pose safety risks with safer, modern designs.
3. Seek to minimize conflicts between motorized and non-motorized traffic through lower roadway speeds where appropriate, provision of safe and convenient street crossings, and other means.
4. Support education and research programs and law enforcement efforts to improve safety for all transportation users, focusing on behaviors resulting in the greatest risk of serious crashes, including driving while impaired, distracted driving (in particular texting), and aggressive driving.
5. Encourage mixed-use development and street designs with vibrant public spaces that support a culture of walking, bicycling, use of transit, and social interaction.
6. Prioritize active transportation facility improvements that will improve access to jobs, schools, healthy food, and other destinations that meet daily needs and those located in areas with health disparities and under-served populations.
7. Promote and facilitate active transportation for short trips, including maintenance of active transportation facilities to ensure year-round availability.
8. Manage access to the regional roadway system to preserve and improve safety as well as operational efficiency.
9. Employ intelligent transportation technologies to improve safety as well as system efficiency and reliability.
10. Design, build, and operate the regional transportation system to support timely and safe response to emergencies.
11. Reduce vulnerability of the public and the region's transportation infrastructure to crime and natural hazards.

Transit Compatible Site and Street Designs

Transit compatible site designs are development configurations that enable convenient access to and from bus routes by minimizing walking distances, providing appropriate densities to support transit ridership, and providing a safe and comfortable boarding and alighting experience. Walkability is key because most transit trips begin and end with walking.

Transit compatible street designs use urban design coupled with street features that encourage safe traffic speeds and prioritize space for pedestrians, bicyclists, and transit. This could include adding bus-only lanes or installing bus bulbs for boarding and alighting as well as providing facilities that make walking or biking to or from stops easier, safer, and more enjoyable. This includes provision of frequent crossing opportunities.



Transit compatible streets and features.

Intelligent Transportation Systems (ITS)

There is no single commonly accepted definition of ITS because the discipline is still in its infancy. ITS encompasses a broad range of technologies that make transportation safer, more efficient, and more convenient by integrating communications technology into infrastructure, vehicles, and other devices. A few examples of ITS include:

- Intelligent traffic control systems that improve traffic flow by changing timing in response to traffic flows
- Traveler information systems that provide current travel time and incident information
- Advanced transit systems that provide real-time vehicle information
- Vehicle-to-vehicle communications that can prevent crashes by alerting drivers or slowing vehicles before crashes occur
- Automated at-grade railroad crossing safety gates



Vehicular travel information on the Beltline. (Channel 3000)

Context Sensitive Solutions (CSS)

Context sensitive solutions take into consideration the built and natural environment ("the context") through which transportation facilities pass, attempting to fit the facility to the physical setting and preserve or complement scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility for users. The application of CSS principles recognizes that transportation is about more than just getting from Point A to Point B. Transportation facilities help shape the character of places and how we experience our daily lives.



Bridge with Madison branding within an urban context.

Goal 3: Support Personal Prosperity and Enhance the Regional Economy

Build, operate, and maintain a transportation system that provides people with affordable access to jobs and enables the exchange of goods and services within the region and to/from other regions.

Policies supporting this goal:

1. Provide for efficient, reliable travel on regional roadways serving major employment centers and those critical to freight movement, reducing excessive delays where possible.
2. Support downtown Madison as the region's largest, most important activity center through improvements to its accessibility by transit as well as other transportation modes.
3. Invest in transportation improvements that foster a quality of life that retains and attracts businesses and employees.
4. Invest in transportation improvements that support the region's role as a major tourist destination.
5. Provide convenient, inexpensive transportation options that allow households to go car-light or car-free, allowing more money to be spent on housing or in the local economy.
6. Encourage redevelopment of established employment/activity centers and major transit corridors to make efficient use of existing transportation infrastructure.
7. Support agricultural activities in rural areas by designing roadways that safely accommodate implements of husbandry.
8. Provide efficient freight access to regional roadways, railroads, and the airport.
9. Promote investments that enhance inter-regional transportation options.
10. Integrate local public transit with intercity service and facilities such as the airport.

Goal 4: Improve Equity for Users of the Transportation System

Provide an equitable level of transportation facilities and services for all regardless of age, ability, race, ethnicity, or income.

Policies supporting this goal:

1. Provide convenient, affordable transportation options that enable people of all ages and abilities to access jobs, services, and other destinations to meet their daily needs. Also support private sector efforts to provide complementary transportation options.
2. Improve transit accessibility to jobs in areas with concentrations of transit-dependent populations and support provision of affordable housing in areas with high transit accessibility to jobs.

3. Ensure that the interests of underrepresented groups (low-income, minority, seniors, disabled, etc.) are considered in the transportation planning process.
4. Ensure that the benefits of regional transportation system investments, in terms of improved accessibility, mobility, and quality of life, are fairly distributed and that adverse public health and environmental impacts from transportation facilities do not disproportionately impact minority and low-income populations.
5. Retrofit existing transportation facilities to make them ADA compliant.

Goal 5: Reduce the Environmental Impact of the Transportation System

Ensure that the transportation system is designed, built, operated, and maintained in a way that protects and preserves the natural environment and historic and cultural resources, and is supportive of energy conservation.

Policies supporting this goal:

1. Design and build sustainable transportation infrastructure and implement operations programs that avoid or mitigate negative environmental impacts and augment positive changes.
2. Incorporate Green Streets elements into street construction and reconstruction, where feasible. Projects should, at a minimum, meet Dane County stormwater standards, but strive to maintain pre-development hydrology.
3. Pursue intelligent transportation technologies that improve traffic flow, encourage eco-driving, make transit and bicycling easier and more convenient, create new mobility services, provide traveler information, and better integrate the different modes. Projects implementing these technologies should encourage and facilitate private sector transportation innovation and integration of public and private transportation options.
4. Incentivize alternatives to single-occupant vehicle driving through strategic investments in alternative transportation, public and employer-based commute options programs, TDM/vehicle trip reduction ordinances, and parking policies.
5. Develop a transportation system that is resilient in the face of climate change and rising fuel prices in the future.
6. Promote the transition to low and no emission fuels for vehicles.
7. Consider land use impacts of transportation investments, ensuring they meet regional goals.
8. Promote the movement of long-distance freight by railroads, which use less fuel per ton-mile than trucks.

Green Streets

Green Streets refers to best management practices that minimize the environmental impact of the transportation system. The streets are designed in a way in which they mimic local hydrology prior to development. A number of treatments can be considered including:

- Narrower street pavements to minimize impervious surfaces
- Swales or vegetated open channels for stormwater storage and runoff
- Bioretention curb extensions, planters, and tree boxes to incorporate stormwater management within the right of way
- Permeable pavement, asphalt, and pavers that can reduce pollutant runoff through built-in filtering to decrease the volume of water diversion into neighboring streams, rivers, and lakes
- Street trees to reduce heat island effects, increase the aesthetic quality of streets, improve air quality, and provide shade for cooling on warm days



Permeable pavement (top), prairie swale (middle), street trees (bottom).

Activity Centers

Activity centers are areas in which there is a concentrated mix of land uses (residential, retail, office, institutional). They are generally bicycle and pedestrian friendly and transit supportive. They serve as a hub of daily activity, allowing those who live there and in surrounding neighborhoods to accomplish multiple activities in a single trip. Activity centers come in different types and sizes from a regional center serving as a center of commerce, to suburban downtown districts, to small neighborhood centers with shopping and restaurants. Activity centers can serve new peripheral development or be created through infill or redevelopment of existing areas. A unique sense of place should be created by attention to the scale, placement, and design of buildings and ensuring adequate public spaces.



Mixed-use activity center concepts in Madison, Waunkee, and Sun Prairie.

Goal 6: Advance System-wide Efficiency, Reliability, and Integration Across Modes

Design, build, operate, and maintain an efficient transportation system with supportive land use patterns that maximize mobility, minimizes unexpected delays, and provides seamless transfers between all modes.

Policies supporting this goal:

1. Encourage compact, mixed-use development patterns, which reduce reliance on the automobile, improving the efficiency and safety of the transportation system.
2. Encourage development in identified transportation and transit corridors and activity centers where adequate transportation facilities and efficient transit service can be provided.
3. Utilize transportation systems management and operations strategies, such as incident, special event, and work zone management, traffic signal coordination, and transit priority treatments, to maximize efficiency and reliability for all transportation modes.
4. Manage access to the regional roadway system to preserve and improve operational efficiency.
5. Provide for a well-connected roadway system with proper roadway spacing that efficiently distributes traffic.
6. Implement policies and programs to manage travel demand on congested corridors in order to maximize system capacity and multi-modal system performance.
7. Promote parking management strategies that make efficient use of facilities and encourage alternative transportation modes while meeting user needs and supporting retail/service businesses.
8. Seek to provide and maintain an acceptable level of service for all travel modes, considering the land use context of the facility and environmental impacts of potential improvements.
9. Utilize intelligent transportation technologies to make travel by all modes more reliable and convenient.
10. Prioritize capacity investments on critical bottlenecks and corridors that serve regional employment centers, particularly those where alternative modes cannot effectively and cost-efficiently serve travel needs.

Goal 7: Establish Financial Viability of the Transportation System

Achieve and maintain a state of good repair for the existing transportation system, invest in cost-effective projects, and ensure adequate, reliable funding to meet current and future needs.

Policies supporting this goal:

1. Make the most efficient use of limited public resources through cost-benefit analyses and consideration of the life cycle costs of projects, including operations and maintenance.
2. Utilize designs, construction techniques, and materials that minimize maintenance costs over time.
3. Promote asset management practices that minimize maintenance costs over time.
4. Prioritize maintenance of existing transportation facilities, strategies to manage travel demand, and improvements to transportation operations over new facilities and capacity expansion projects.
5. Support compact, transportation-efficient development that makes use of existing transportation system capacity.
6. Preserve transportation corridors and other needed land for future travel uses.
7. Support inter-jurisdictional coordination in planning and project delivery.
8. Leverage federal and state funding for large-scale projects that will provide significant benefits to the regional transportation system.
9. Support sustainable funding options beyond the state gas tax and local property tax, and a regional transit governance structure such as a regional transit authority.
10. Foster innovative financing and public-private partnerships for projects.

PERFORMANCE MEASURES

The *Moving Ahead for Progress in the 21st Century Act* (MAP-21) transformed the way that MPOs develop transportation policies and plans and changed the way that they make funding decisions and program new projects. MAP-21 required that a performance-based approach be taken to transportation planning and programming to achieve local, state, and national performance goals. The current transportation bill, the Fixing America's Surface Transportation (FAST) Act, continues this approach. MPOs are now required to:

- incorporate performance management systematically into regular ongoing processes;
- provide key information to help decision makers understand the consequences of investment decisions across multiple markets;
- improve communications between decision makers, stakeholders, and the traveling public; and
- ensure that targets and measures are developed in cooperative partnerships based on data and objective information.

The national performance goals included in FAST Act did not change:

- Safety - To achieve a significant reduction in traffic fatalities and serious injuries on all public roads
- Infrastructure Condition - To maintain the highway infrastructure asset system in a state of good repair
- Congestion Reduction - To achieve a significant reduction in congestion on the National Highway System, which includes all major or principal arterial roadways
- System Reliability - To improve the efficiency of the surface transportation system
- Freight Movement and Economic Vitality - To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development
- Environmental Sustainability - To enhance the performance of the transportation system while protecting and enhancing the natural environment
- Reduced Project Delivery Delays - To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices





National Performance Goals are set in a variety of transportation topic areas.

MATPB has demonstrated its commitment to performance-based planning by releasing its first annual Performance Management Report in 2016. Based upon the goals of RTP 2050, the Performance Measures Report links measures to goals in an effort to quantify outcomes. For the first year of the report the following measures, organized around the goals, were selected:



Create Connected Livable Neighborhoods and Communities

- Miles of Pedestrian Facilities
- Miles of Bicycle Facilities
- B-Cycle Utilization
- Active Living Index Scores

Improve Public Health, Safety, and Security

- Number and Rate of Motor Vehicle Crash Fatalities and Serious Injuries
- Number and Rate of Non-Motorized Fatalities and Serious Injuries
- County-wide Five-year Rolling Average Rates of Crashes, Injuries, and Fatalities

Support Personal Prosperity and Enhance the Regional Economy

- Airline Passenger Traffic
- Freight Exports and Imports
- Housing + Transportation Costs
- Transit Access to Jobs

Improve Equity for Users of the Transportation System Transit Ridership

- Fixed-Route Transit Service Area
- Transit Access to Employment
- Transit Coverage for Underrepresented Groups

Reduce the Environmental Impact of the Transportation System

- Vehicle-Miles Traveled
- Mode of Transportation to Work
- Air Quality

Ensure System-Wide Efficiency, Reliability, and Integration Across Modes

- Transit On-time Performance
- Percent of Key Destinations Served by Transit
- Roadway Congestion and Reliability

Ensure Financial Viability of the Transportation System

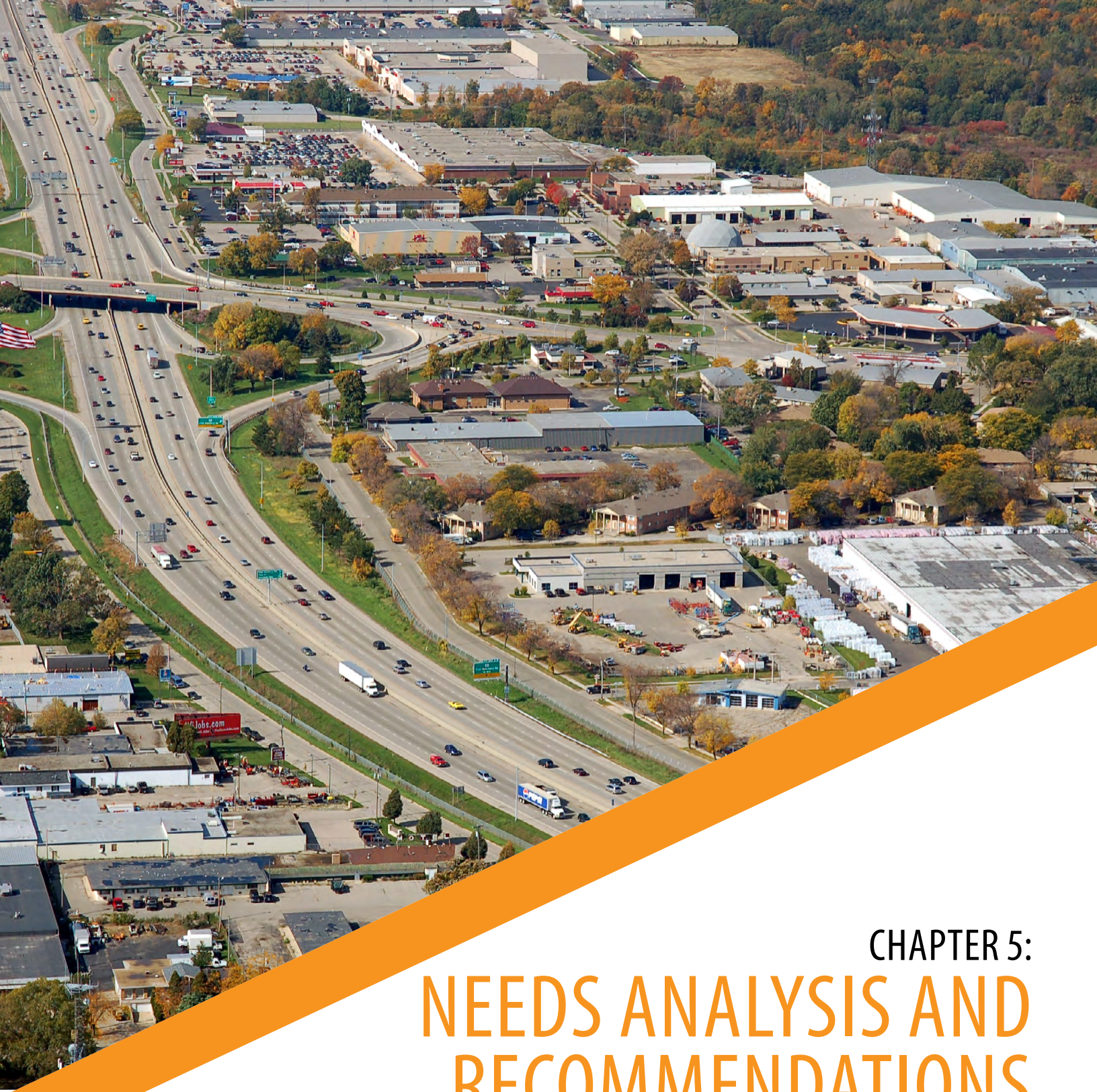
- Bridge Condition
- Roadway Pavement Condition
- Metro Vehicle On-Road Service Calls
- Buses At or Past Replacement Age

The performance measures selected were not intended to be exhaustive. Rather, the list includes key measures that allow annual tracking of meaningful progress towards achieving plan goals and for which accurate, easily obtainable data is available. Some measures are applicable to more than one goal but have been organized under the goal that fits best. Some aspects of the plan goals are not addressed by the measures due to unavailable, incomplete, or inaccurate data. It is anticipated that the list of performance measures will evolve over time as new data and measurement techniques become available. Targets for the measures will be set in concert with WisDOT, following the release of final federal rules for some of these measures.

To learn more about performance management requirements and how they fit into the overall planning process, refer to Chapter 1.


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CHAPTER 5:
NEEDS ANALYSIS AND RECOMMENDATIONS

- Introduction
- Land Use and Transportation Integration
- Streets and Roadways
- Public Transit
- Bicycles
- Pedestrians
- Specialized Transit
- Transportation Demand Management
- TSM, Operations, and ITS
- Freight, Air, and Rail
- Parking

INTRODUCTION

MATPB undertook an exhaustive analysis of the existing transportation network, prior and ongoing planning efforts, and input received from stakeholders and the public. MPO staff then synthesized the transportation system needs and developed a series of recommendations with supporting actions for each mode of transportation, TDM and TSM strategies to optimize use and capacity of existing facilities, and general recommendations for land use and transportation integration.



Implementing agencies, including WisDOT and local governments, are encouraged to use the following recommendations when undertaking planning efforts and implementing transportation projects to ensure regional continuity and consistency of the transportation system and support regional transportation goals and policies. The discussion of needs and the recommendations is organized by topic area and mode with the recommendations and supporting actions/strategies or implementation steps highlighted in the tables.

Needs and Recommendations are organized as follows:

- Land Use and Transportation Integration
- Streets and Roadways
- Public Transit
- Bicycles
- Pedestrians
- Inter-Regional Travel
- Specialized Transit
- Travel Demand Management (TDM)
- Transportation System Management (TSM), Operations and Intelligent Transportation Systems (ITS)
- Freight, Air, and Rail
- Parking

Appendix A contains a complete table of the recommendations and supporting actions.

LAND USE AND TRANSPORTATION INTEGRATION



Land use and transportation are inextricably related. The ultimate role of transportation is to connect people with opportunities, services, goods, and other resources. In order for transportation policies and investments to be successful in achieving this, they must be coupled with supportive land use policies. Spread out land use patterns and single use developments increase automobile dependency for accessing economic opportunities and needs, thereby placing other travel modes at a disadvantage. Pedestrian-friendly neighborhoods, with a variety of land uses in close proximity, improve access to destinations and promote affordability by making alternative travel modes more convenient.

Coordinate land use and transportation. Coordinating land use and transportation requires that local communities evaluate how land use decisions affect the transportation system and travel options for people to access jobs, services, and other destinations. It requires that transportation agencies and providers consider the effects of transportation investments on land use development demand, travel choices, and regional land use patterns. This also means that transportation agencies and local communities must communicate to craft coordinated strategies, plans, and programs.

The following recommendations can help ensure the compatibility and integration of local land use plans with the regional transportation plan.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Adopt local land use plans and policies that support RTP goals and policies.		
A	Update land use ordinances, street design, and parking standards to remove barriers to mixed-use, pedestrian-friendly development, where appropriate.	Ongoing	Local governments
B	Prepare detailed neighborhood development plans in areas slated for growth prior to development in order to ensure good street connectivity, adequate bicycle accommodations, and efficient transit routes (where appropriate).	Ongoing	Local governments
C	Require or provide incentives for including pedestrian, bicycle, and transit facilities (where appropriate) in (re)developments.	Ongoing	Local governments
D	Plan, zone for, and encourage transit-supportive development in planned transit corridors.	Ongoing	Local governments
2	Develop urban areas with a mix of housing types and land uses to provide walkable, affordable neighborhoods.		
A	Plan for mixed-use centers of varying scales and types to provide housing in proximity to a mix of uses.	Ongoing	Local governments
B	Develop new employment centers and government/institutional developments in mixed-use settings, where compatible, to provide for housing near jobs and schools.	Ongoing	Local governments
C	Support the revitalization of downtown areas and walkable neighborhoods with infrastructure investments and incentives.	Ongoing	Local governments
D	Promote new development in multi-modal mobility corridors to maximize the efficiency of transportation system and the accessibility of jobs and services.	Ongoing	Local governments

STREETS AND ROADWAYS

Streets and roadways provide mobility for the vast majority of the residents in the region, regardless of whether they drive, take transit, or ride a bicycle. Streets can also be considered the "living rooms" of neighborhoods throughout the community, providing an outdoor space to congregate, recreate, and socialize. It is important to preserve this infrastructure and make targeted enhancements, when appropriate. The following highlights the major needs and recommendations to ensure the efficiency, safety, and cost effectiveness of the roadway network.



Preserve existing regional roadway infrastructure. Preserving the regional roadway system—including pavement, bridges, and associated infrastructure such as signals, lighting, and storm water facilities—is critical for safe and efficient travel. Well-maintained roads also help to reduce vehicle operating costs, retain and attract businesses, and improve quality of life for the region's residents.

Roadways and bridges can last a long time before they need to be reconstructed or replaced (typically 50+ years for roads and 50-75 years for bridges). However, routine small-scale maintenance and periodic rehabilitation are necessary to combat the steady deterioration that results from roadway use and weathering, and avoid the need for premature pavement reconstruction.

Figure A-1 in Appendix A lists programmed, planned, and other potential cost-high preservation projects that may be needed during the planning period. This includes both peripheral area arterial roadways that will need to be reconstructed to urban standards to accommodate planned development and arterial streets within developed areas that will require reconstruction due to their age and condition.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Preserve and maintain the region's street and highway system in a manner that minimizes life cycle cost, maintains safety, and minimizes driver costs while reducing their impact on the environment.		
A	Monitor regional roadway system pavement and bridge condition and coordinate with WisDOT to establish performance targets.	1-5 years	MPO, WisDOT
B	Develop and implement asset management plans to facilitate cost-effective decision-making concerning the maintenance and rehabilitation of roadways, bridges, and associated infrastructure.	Ongoing	WisDOT, Dane County, local governments
C	Provide for ongoing maintenance activities in major state and local arterial corridors planned for future potential expansion until capacity is needed and major project funding can be secured.	Ongoing	WisDOT, Dane County, local governments
D	Continue enforcement of truck weight regulations to reduce premature deterioration of roadways and bridges.	Ongoing	WisDOT
E	Support additional research and demonstration projects, including use of emerging technologies, to provide safe roadways in the winter while minimizing the use of road salt.	1-5 years	WisDOT, Dane County, local governments

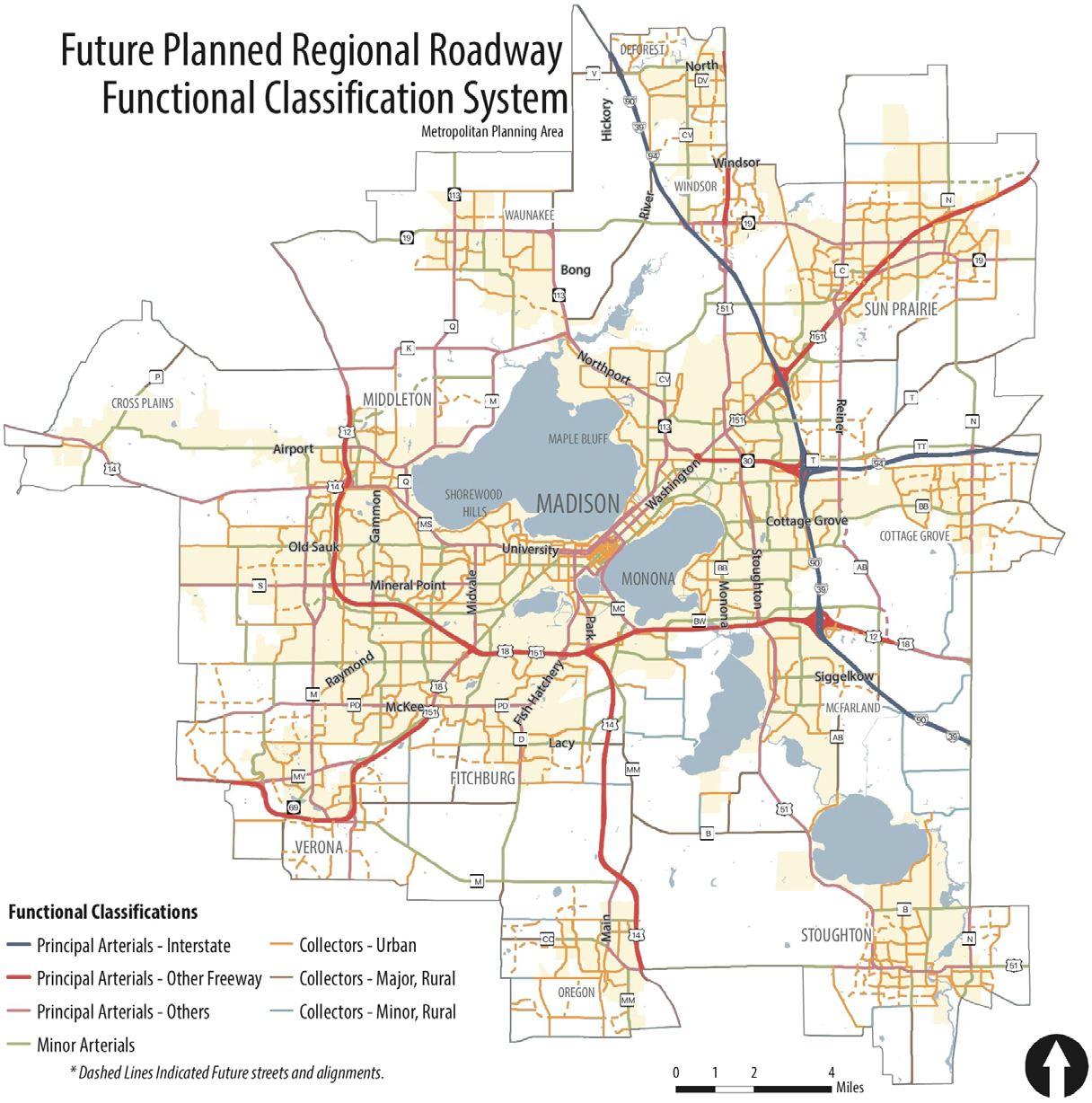


Figure 5-1: Future Planned Roadway Functional Classification System.

Construct new roadways to efficiently accommodate future growth. Planning for and building a well-connected roadway network to serve developing areas is crucial for efficiently distributing traffic on the regional system. As connectivity of the system increases, travel distances decrease and route options increase, creating a more efficient and resilient system. Dispersing traffic over a larger number of routes benefits traffic circulation and better supports alternative travel modes by providing more route options and limiting the need for overly wide arterials and intersections that serve as barriers to pedestrians. Other benefits of a well-connected network include improved emergency response and increased efficiency and safety of services such as garbage collection and street sweeping.

The traditional roadway functional classification system described on pages 3-3 to 3-5 provides a good starting point for planning and managing our roadway system to provide mobility for moving passenger and freight traffic while also providing property access, parking, and safe, convenient, and comfortable travel for non-motorists. Traffic speeds, access, and level of street connectivity should vary depending on the function of the street. The design of streets and the level of traffic congestion

tolerated must also consider the land use context, community development goals, and all modes of travel.

Figure 5-1 illustrates the planned future roadway functional classification system, including important planned collector streets and existing collectors that are likely to transition into minor arterials in the future to serve new development. Examples include the Pioneer/Meadow/Woods/Nine Mound Road corridor on Madison's west side, the planned Belle Fontaine Boulevard in Middleton, Portage Road on the north side, and Egre Road (including planning extension to US 151) in Sun Prairie. The Grand Avenue/Reiner Road/Sprecher Road/CTH AB corridor on the east side is anticipated to function as a principal arterial in the future.

Recommendations and Supporting Actions		Timeframe	Implementing Party
2	Build a well-connected network of regional roadways to accommodate future growth and avoid the need for overly wide streets and intersections that create barriers for pedestrians and bicyclists.		
A	Conduct detailed planning for new collector streets and utilize official mapping, right-of-way dedications, and other methods to preserve existing and planned regional roadway corridors for potential expansion.	Ongoing	Local governments
3	Incorporate complete streets and green streets concepts for regional and local roadways.		
A	Utilize evaluation criteria and scoring guidelines for selecting MPO funded projects that encourage the inclusion of complete and green streets elements.	Ongoing	MPO
B	Adopt and implement a formal complete streets policy.	1-5 years	WisDOT, Dane County, Local governments

<u>Expand the regional roadway system strategically to address critical bottlenecks and accommodate future growth.</u>
Household and employment growth and development and travel trends, such as increased suburb-to-suburb travel, have led to increasing traffic volumes and congestion levels on the regional roadway system. If conditions continue to get worse, delays caused by congestion will negatively affect the region's economic competitiveness and quality of life.

Traffic volumes have increased the most on the Beltline, the Interstate, and other circumferential arterials such as CTH K, WIS 19, and Stoughton Road (US 51). Volumes have also spiked on radial arterials leading to the Beltline and Interstate system, including Verona Road (US 18/151), Fish Hatchery Road, and US 151. The Beltline exhibits by far the highest congestion levels. Other arterial roadway corridors with high congestion levels include: University Avenue, Johnson/Gorham Streets, East Washington Avenue, Fish Hatchery Road, Verona Road, and CTH M. Projects are underway to provide needed capacity in the Verona Road and CTH M corridors, while studies are underway to develop long-term solutions in the Beltline and Stoughton Road corridors.

In addition to addressing existing traffic congestion, future projected traffic from planned growth must also be accommodated. A regional travel demand model is used to forecast future travel based on forecast growth and assumed changes to the roadway and transit system. An iterative process was used whereby the planned future transportation system - including Bus Rapid Transit, planned new two-lane collector streets, and street extensions - was modeled first to determine its ability to accommodate expected traffic prior to consideration of new capacity expansion projects on the periphery.

Major local arterial expansion projects identified as needed to serve developing or planned new development areas include: Pleasant View Road; CTH PD west of CTH M; Reiner/Sprecher/CTH AB corridor; CTH T (N. Thompson Drive to Reiner Rd.), and the extension of Lien Road. It is recommended that new arterial streets with more than two travel lanes generally include medians, where possible, with appropriate openings for turning movements and turn lanes. Access management strategies, such as restricting driveway access, should also be used for arterial streets. These and other design strategies provide for more efficient travel and improve safety.

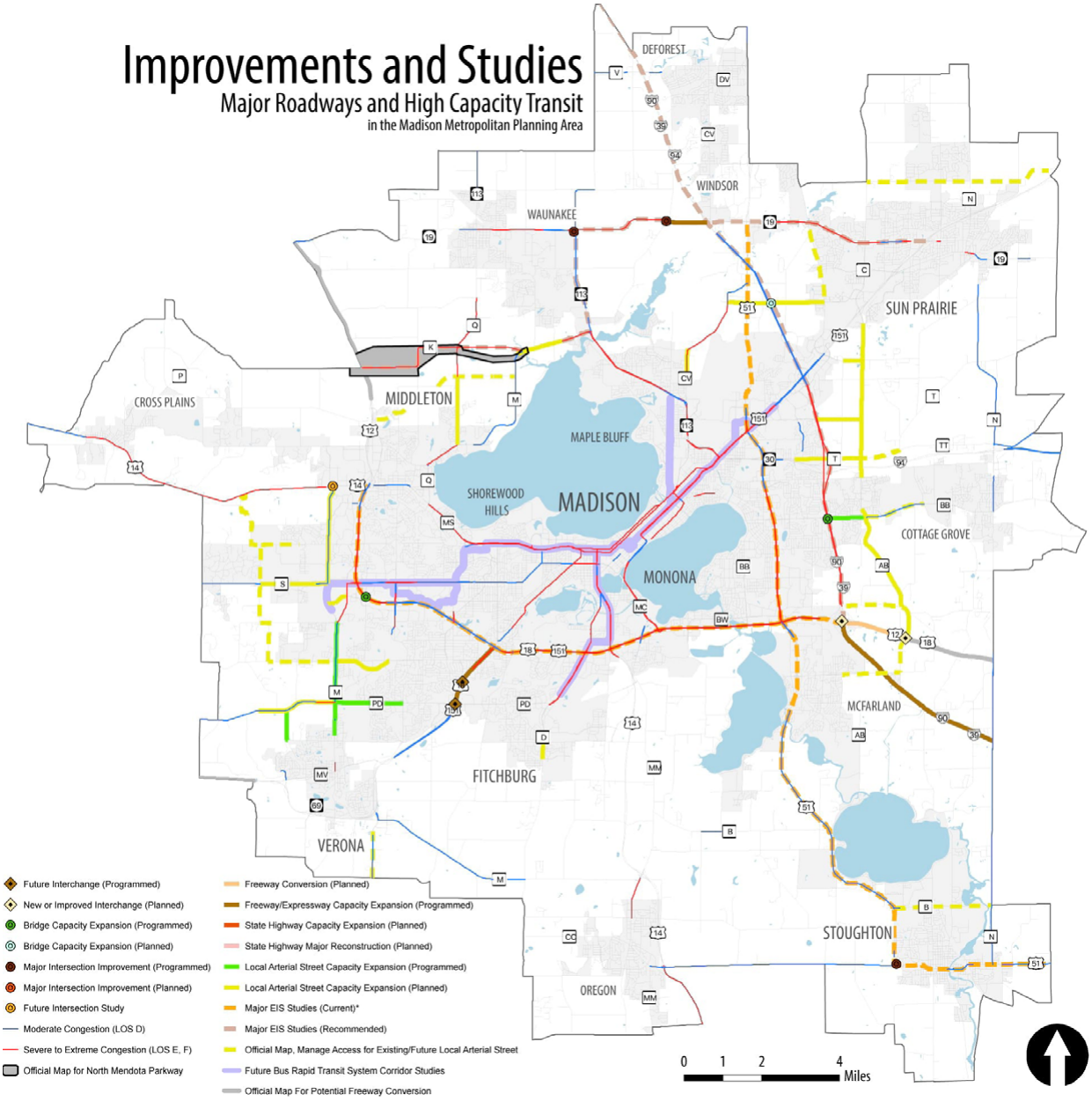


Figure 5-2: Major Roadway and High Capacity Transit Improvements and Studies.

Other than the programmed Verona Road (US 18/151) and Interstate 39/90 projects, the only other state highway capacity expansion projects included in the plan at this time are: Beltline/Interstate interchange, which is technically part of the Interstate expansion project; and US 12/18 freeway conversion with new CTH AB interchange, which is Phase 3 of the Beltline/ Interstate interchange project. Additional state highway capacity expansion project recommendations are expected to come out of the ongoing major corridor studies of Stoughton Road (US 51) and the Beltline (US 12/14/18/151). A future study is recommended for both the WIS 19/WIS 113/CTH M (North Mendota Parkway) and I-39/90/94 Interstate corridors. Because the scope of improvements in these corridors is unknown and funding has not been identified, the corridors are listed as studies. Once the studies are completed, the scope of improvements identified, regional agreement reached on them, and funding determined to be available in the future, the projects will be amended into the plan.

Figure 5-2 illustrates and Figure A-1 in Appendix A lists recommended major capacity expansion, intersection, interchange,

and bridge widening projects as well as major state highway corridor studies. Section 1 of Figure A-1 in Appendix A lists programmed projects for 2017-2020 and Section 2 lists additional planned projects grouped into two 15-year time periods (2021-2035, 2036-2050). The actual timing of the planned projects will depend on future development and traffic growth, impacts of congestion management strategies, system preservation needs, available funding, and other factors. Figure 5-2 highlights remaining areas of high peak period traffic congestion on the arterial roadway system that will need to be addressed with congestion management strategies as part of the regional Congestion Management Process.



Section 5 of the Figure A-1 in Appendix A includes a short list of "illustrative" major capacity expansion projects that are not part of the fiscally constrained, federally recognized plan. These include the two ongoing major state highway corridor studies of the Beltline and Stoughton Road, the environmental assessment study of the US 51 corridor study, which includes a segment west of Stoughton proposed for expansion, and the western segment of the North Mendota Parkway project on new alignment between CTH M and US 12 along with CTH CV and Q. Inclusion of these projects in the federally recognized plan is dependent upon completion of the environmental studies and demonstration that funding is likely to be available for them.

Recommendations and Supporting Actions		Timeframe	Implementing Party
4	Expand regional roadway system capacity to address critical bottlenecks and accommodate future planned growth consistent with RTP goals and policies.		
A	Continue or initiate detailed planning, design, and construction of state and local arterial capacity roadway, bridge, and interchange projects shown in Figure 5-2 and listed in Figure A-1 as needed with consideration given to project phasing where appropriate.	Ongoing	WisDOT, Dane County, Local governments
B	Complete study of the Beltline/Interstate interchange. Upon completion of accepted EIS, advance recommended alternative, with consideration given to phasing, compatibility of the design with potential Beltline/Stoughton Road interchange improvements, and planned US 12/18 freeway conversion east to CTH AB.	1-10 years	WisDOT
C	Complete major corridor studies of the Beltline and Stoughton Road/US 51. Upon completion of accepted EISs, seek enumeration as Majors projects and advance recommended alternatives using a phased approach. Continue to implement short-term TSM, safety, and multi-modal improvements in the corridors in the interim until Majors program funding is secured.	1-10 years	WisDOT
D	Complete environmental assessment and refine the design for the preferred alternative for the US 51 (McFarland to Stoughton) corridor, which includes reconstruction of most of the roadway, intersection improvements, and expansion to 4 lanes between WIS 138 and CTH B. Upon completion, seek enumeration as Majors project or alternative funding and advance project using a phased approach. Implement safety and TSM improvements and maintenance work in corridor in the interim if Majors program or other funding is not secured.	1-10 years	WisDOT
E	Initiate major study of the WIS 19/WIS 113/CTH M corridor to identify the long term solution to existing and future congestion and safety issues in the east-west corridor north of Lake Mendota. Officially map the corridor and initiate detailed planning of the recommended alternative, including appropriate phasing and funding strategies. Continue in the meantime to implement TSM, safety, and multi-modal improvements.	1-10 years	WisDOT, Dane County, MPO
F	Identify the appropriate limits and initiate study of the I-39/90/94 corridor north of the Beltline to address safety, operations, and congestion issues and in the meantime implement TSM and safety improvements.	1-10 years	WisDOT, MPO

Continue to pursue safety improvements. Traffic safety affects the metro area on many levels. Crashes cause personal tragedy, lost productivity, rising insurance costs, increased costs for police, emergency medical, and other social services, and also disrupt the movement of people and goods in the region. Safety concerns can also prevent people from choosing to walk or bicycle.

User behavior is a contributing factor in nearly every crash. For example, alcohol and drugs were a contributing factor in 57% of the county's fatal crashes between January 2010 and December 2015. Excessive speed, aggressive driving, and driver inattention are other common contributors to serious crashes. Other factors contributing to crashes are roadway and environmental conditions and in some cases vehicle failure. The types and designs of roadways can help minimize the potential for crashes and the likelihood of serious injury in the event of a crash.

Motor vehicles today are the safest they have ever been, with many features to protect the occupants in the event of a crash. The advent of connected vehicle technology is now shifting the focus of efforts to crash avoidance. Connected vehicle applications allow vehicles to "talk" to each other (V2V) and to roadway infrastructure (V2I) such as traffic lights, stop signs, and work zones. Using this information, vehicles can identify risks and provide warnings to drivers to avoid imminent crashes or even automatically take over driving functions such as braking. The National Highway Traffic Safety Administration (NHTSA) estimates that safety applications enabled by V2V and V2I technology could eliminate or mitigate the severity of up to 80 percent of non-impaired crashes at intersections and while changing lanes.



Source: Madison Fire Department

Recommendations and Supporting Actions		Timeframe	Implementing Party
5	Address safety needs on the regional roadway system through a comprehensive "3-E" approach that includes implementation of cost-effective engineering counter measures (i.e., roadway reconfiguration, new or modified traffic control devices, etc.), education, and enforcement.		
A	Implement WisDOT's 2014-2016 Wisconsin Strategic Highway Safety Plan (SHSP) and future updates to the plan.	Ongoing	WisDOT, Dane County, local governments, state agencies, law enforcement agencies, private organizations
B	Undertake planning process to identify regional roadway corridors and intersections with the highest crash rates and conduct further detailed study of these locations to identify countermeasures and prioritize projects for federal and state Highway Safety Improvement program funding.	1-5 years	MPO, Dane County, local governments
C	Continue efforts to implement short-term safety-related and TSM improvement recommendations from preservation/safety studies in state highway corridors, including US 14 (West), WIS 19, and WIS 138.	Ongoing	WisDOT
D	Develop and implement access management plans and standards for existing and future arterial roadways as development and street reconstruction occur.	Ongoing	WisDOT, Dane County, Local governments
E	Continue to implement cost-effective changes to traffic signals and signs that have been found to reduce crashes (e.g., use of light emitting diode (LED) lighting, overhead street signs on arterials, etc.).	Ongoing	WisDOT, Local public works/traffic engineering agencies
F	Officially map the US 12 (Parmenter St. to WIS 19 West), US 12/18 (Interstate to CTH N), and US 18/151 corridors for potential future freeway conversion based on recommended study alternatives. Continue to implement interim access management improvements, with future conversion dependent upon ongoing needs assessment and available funding.	Ongoing	WisDOT
G	Continue to expand state and local safety education efforts, including neighborhood-based initiatives.	Ongoing	WisDOT, local governments, non-profit organizations
H	Continue to support and expand local traffic enforcement activities such as use of local traffic teams and undertaking special enforcement initiatives.	Ongoing	Dane County and local law enforcement agencies
6	Address security needs related to the regional roadway system.		
A	Update the vulnerability assessment of critical transportation infrastructure in the state as part of development of the State Highway Investment Plan. Monitor identified facilities and make improvements as needed.	Ongoing	WisDOT
B	Complete current update and update as necessary Dane County Hazard Mitigation Plan to reduce risk of disruptions to the regional roadway system due to severe weather conditions, flooding, terrorism, hazardous material spills, civil disorder, climate change, and other events.	1-5 years	Dane County, Local governments
C	Initiate study to identify transportation facilities that are susceptible to flooding, identify alternate routes when flooding occurs, and identify improvements to make the facilities more resilient to flooding.	1-5 years	MPO, Dane County, Local governments
D	Update the county's Emergency Evacuation Plan, as necessary.	1-5 years	Dane County

Simplify navigation of the regional roadway system. There are numerous instances on the regional roadway system where the name of a roadway changes due to crossing jurisdictional boundaries or due to another historic anomaly. Instances such as the one illustrated below should be rectified to ensure that wayfinding is simple for residents, tourists, and freight carriers alike.



This roadway's name changes from Portage Road to Rattman Road to American Parkway and finally to Nelson Road within a 4 mile stretch. Source: Google Maps.

Recommendations and Supporting Actions		Timeframe	Implementing Party
7	Address roadway naming inconsistency along corridors.		
A	Initiate a study of regional roadway naming conventions to simplify wayfinding in the region.	1-5 years	MPO

PUBLIC TRANSIT

The short- and medium-term needs of the Madison area transit system are identified and well documented in the current *Transit Development Plan for the Madison Urban Area* and *Madison Transit Corridor Study – Investigating Bus Rapid Transit in the Madison Area*. The transit element of the Regional Transportation Plan builds upon these planning efforts to identify a long-term vision for the regional transit system.



Figure 5-5 on page 5-13 illustrates this future planned transit network. With implementation of the planned transit network, the number of average weekday boardings on the system is projected to more than double from around 41,000 to 91,000 by 2050 with assumed growth, while the number of trips (excluding transfers) is projected to grow 80% to 74,000. This excludes supplemental school

service ridership. The larger increase in boardings compared to trips is due to the increased transfer rate with the BRT system and additional peripheral routes. BRT system ridership is projected at 26,300, 29% of the system total.

Implementation of the planned transit system would greatly increase job accessibility by transit. Figure 5-3 and 5-4 illustrate the percent of existing jobs that can be reached within 45 minutes (including walking and waiting time) using the existing and planned transit system.

While Figure 5-5 is the transit system vision, a significant new infusion of funding—most likely through creation of a regional transit authority providing a dedicated funding source—will be needed to achieve it. For more information, see Financial Analysis in Chapter 6.
The following describes the identified transit facility and service needs and recommendations with supporting actions to address them.

Implement a Bus Rapid Transit System and restructure routes accordingly.
MATPB and Metro Transit led the *Madison Transit Corridor Study* in 2013 using funding secured by the Capital Area Regional Planning Commission through a Sustainable Communities grant. The study identified four corridors that are suitable for BRT. BRT elements identified in the plan include frequent, direct, limited-stop service, branded buses, stations with level boarding, and off-board fare collection, and transit priority measures like bus lanes and transit signal priority. These corridor improvements will increase capacity and reduce travel times for transit riders throughout the Madison area, allowing Metro to reverse the recent downward

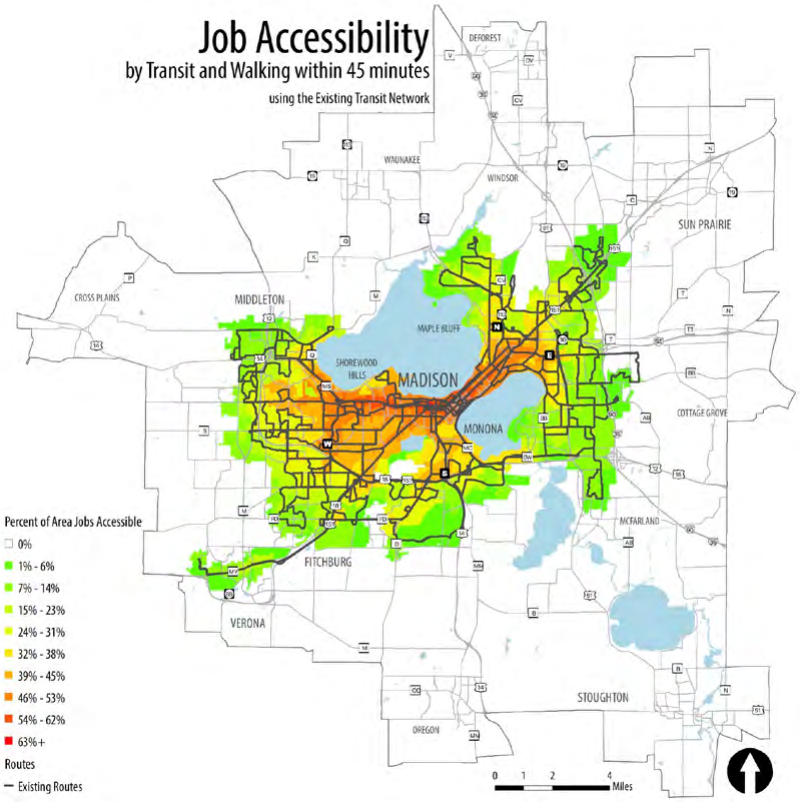


Figure 5-3: Job accessibility within 45 minutes by using existing transit system and walking.

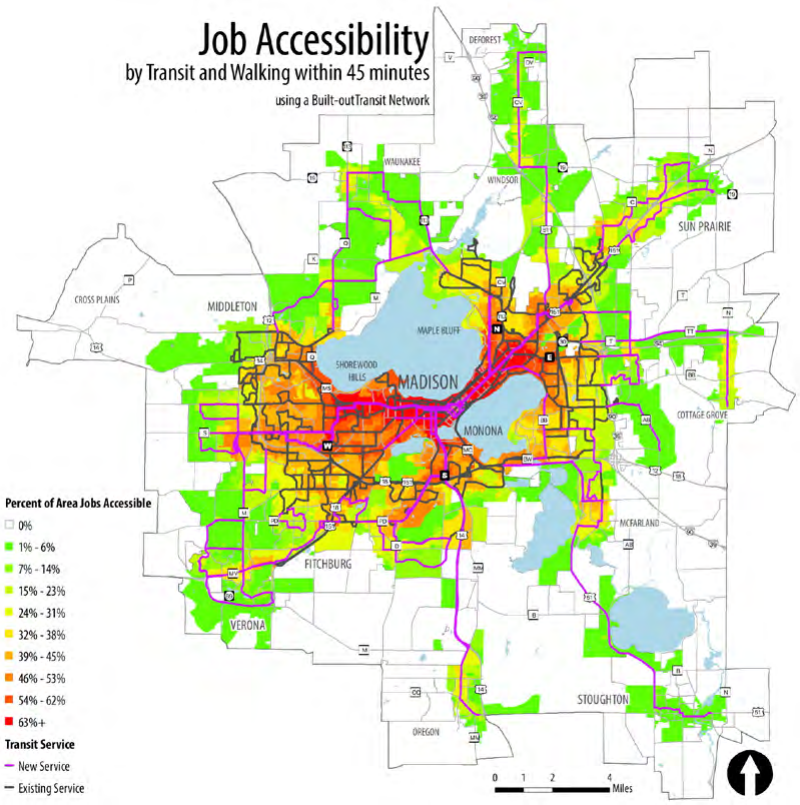


Figure 5-4: Job accessibility within 45 minutes by using planned transit system and walking.

trend in bus ridership over the past two years. Capital costs could be funded in large part through a federal Small Starts grant.

Policy-makers and planners in the Madison area have recognized the need for a large-scale investment in public transportation like light rail, commuter rail, and bus rapid transit for several decades. Planning documents in the 1980s showed a combination of light rail and bus rapid transit. In the 1990s and 2000s the focus shifted to commuter rail using underused and abandoned rail corridors. The Transport 2020



Example BRT configuration. Source: CDOT

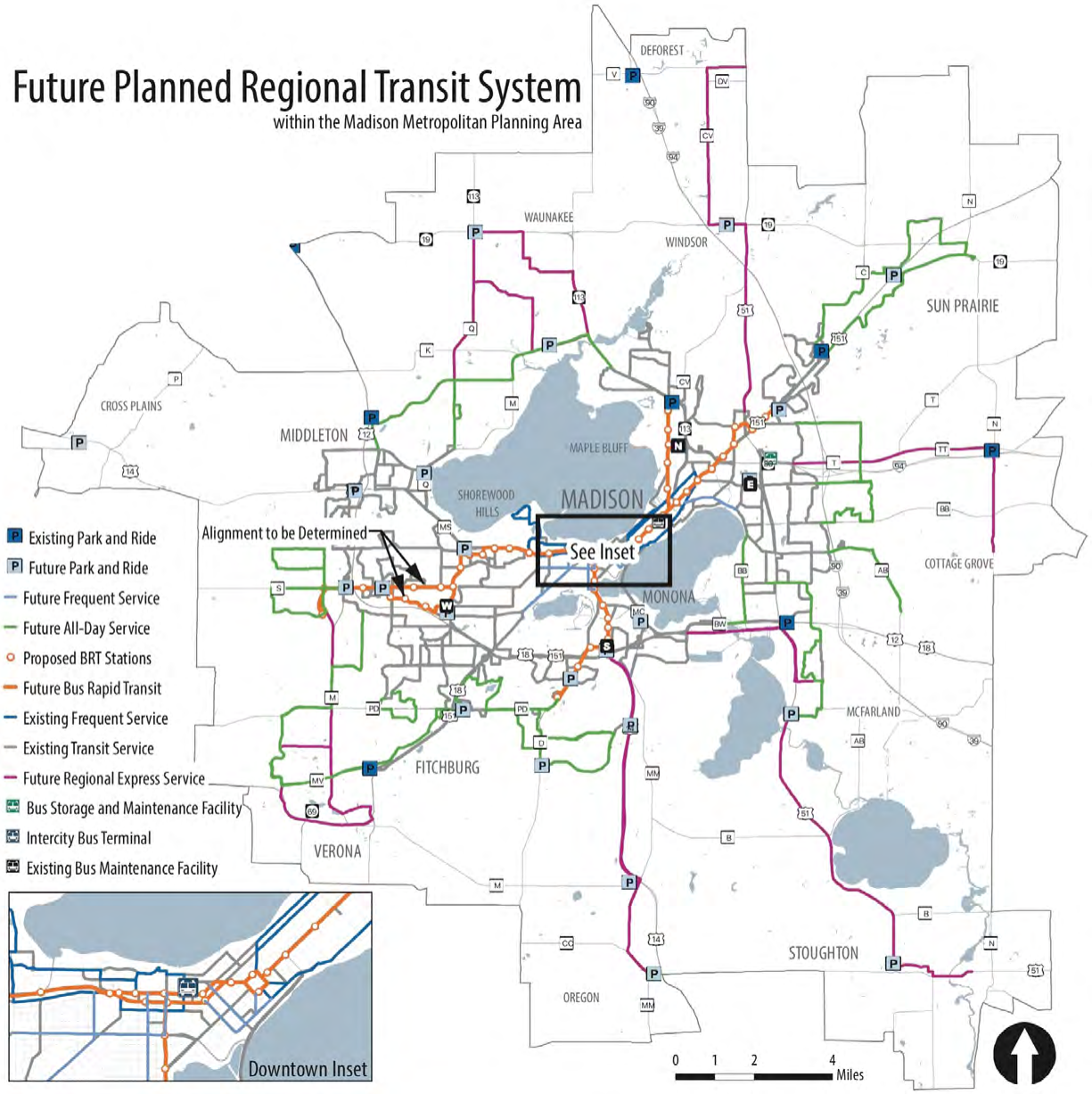


Figure 5-5: Future Planned Regional Transit System

study culminated in a locally preferred alternative in 2008 including a hybrid light rail / commuter rail line in the east-west corridor between Middleton and northeast Madison. The project was put on hold due to lack of funding.

BRT is essentially rail-like bus service, with many of the advantages of rail at a small fraction of the cost. The introduction of a BRT system will necessitate a restructuring of the bus routes on a scale similar to the 1998 restructuring when the transfer point system was adopted. Local routes will be adjusted to reduce duplication with BRT and provide better connections to the new high quality service. Besides better integration with BRT, restructuring routes will address other local transit needs, such as making the system easier to understand by replacing many overlapping low-frequency routes with fewer high-frequency routes.

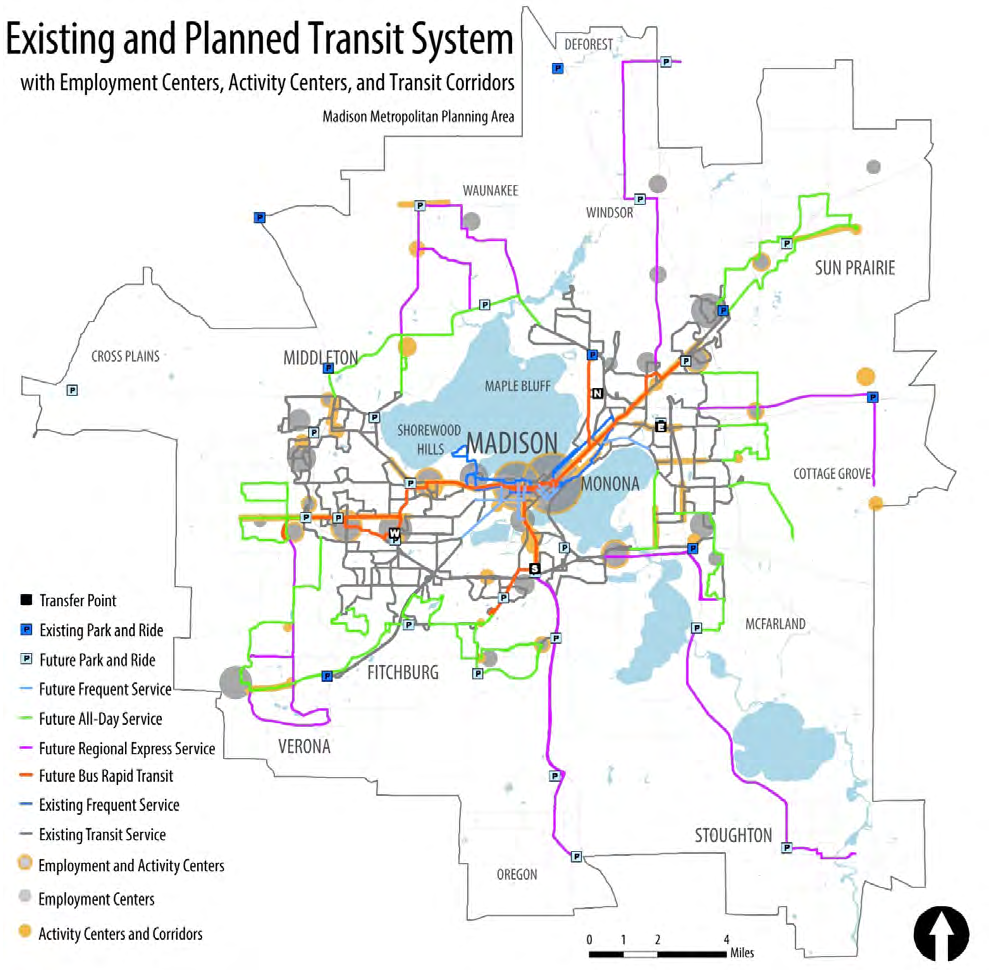


Figure 5-6 Existing and Planned Transit System with Employment Centers and Activity Centers and Corridors

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	**Implement a Bus Rapid Transit System.**		
A	Complete an alternatives analysis and project planning, leading to an initial BRT Project.	1-5 years	City of Madison and other Local Governments, Metro, MPO
B	Expand the BRT network to fulfill the BRT Vision in the Madison area.	5-15+ years	Cities of Madison and Fitchburg, Metro, MPO
C	Plan for the expansion of BRT into other corridors, including Middleton, southwest Madison, Fitchburg, southeast Madison, and Sun Prairie.	15+ years	Metro, MPO, Local Governments
D	Expand the use of transit priority treatments, focusing on the BRT corridors.	Ongoing	Metro, MPO, Local Governments

Improve the existing local bus network by reducing travel times, increasing frequency, increasing capacity, providing service to new neighborhoods, and enhancing first and last mile connections. With a growing service area and limited service outside peak periods and on weekends, transit travel times for longer distance trips are far greater than driving. Many cross-town trips take an hour or longer due to routing through neighborhoods and transfers. Travel times must be shortened and more direct service added throughout the day.



Related to the need for reduced travel times is a need increase service frequency in some parts of the network in the greater Isthmus area. High-frequency routes are generally defined as those in which a rider does not have to check a schedule before traveling to a transit stop – generally 15 minute service or better. Currently, a limited number of neighborhoods in the region are served with high-frequency service and are predominantly located in central Madison. High density corridors need consistent, frequent local all-day service. Such corridors include Monroe Street, Regent Street, Mills Street, Broom and Bassett Streets, and Atwood Avenue.

Along with frequency improvements, capacity improvements must be made on heavily traveled routes. Metro operates a fixed-route fleet of 40-foot transit coaches that seat about 35 and allow for about 20 standees. Several routes routinely suffer from overcrowded conditions, including instances where passengers are passed by because the bus is full. Constructing the Nakoosa Trail bus storage and maintenance facility will allow Metro to increase its fleet and introduce larger articulated buses which will be required to accommodate future high-capacity transit, new all-day service, and regional routes.

When new neighborhoods are fully developed, full transit service should be provided. Some neighborhoods in peripheral Madison, Middleton, Fitchburg, and Verona currently only have service during weekday peak periods and require service throughout the day to provide access to jobs with nontraditional schedules as well as trips serving other purposes. Sun Prairie arguably has the most urgent need for all-day fixed-route bus service. With a population of about 30,000, Sun Prairie is now served by a publicly subsidized shared-ride taxi system. While popular, this system is strained by capacity limitations and does not provide convenient and affordable service to Madison.

Finally, the transit system must be accessible for those that live and work near transit stops, but outside of reasonable walking distance. Connecting transit routes provide a good option, but their typical low frequencies and circuitous routes, combined with transfers, drive up travel times. Further, they sometimes have low usage and can be expensive to operate, providing relatively low utility to the community.

Alternative first mile/last mile strategies are emerging that may be a viable alternative to new fixed-route service in low-density, peripheral areas. Improving pedestrian and bicycle access to transit stops may provide riders with increased access to the transit network. Bike-share programs like BCycle are an option but they require a high density of docking stations to be successful and are not an option for everybody, especially during cold and rainy weather. Public shared-ride taxi systems and other rideshare schemes may be effective in very low demand areas.

Point-deviation routes have not historically been widely deployed in the Madison area, but with Madison's peripheral neighborhoods growing and stretching Metro Transit's resources, they may fill a limited niche. Point-deviation routes typically follow a route with a conventional schedule, but are allowed to deviate slightly in order to serve riders. In low-density areas, point-deviation routes have the potential to serve larger areas within a fixed budget compared to fixed routes. They also have

the potential to reduce the number of transfers for long cross-town trips, which are more likely to be relied upon by low-income and minority riders, according to the 2015 Metro Transit Onboard Passenger Survey.

In the example route shown in figure 5-7, a bus would travel between the South Transfer Point and West Towne Mall along the dark blue line, but could make reasonable deviations to serve the light blue shaded area. Such a route may provide cost-effective all-day service to neighborhoods that currently have no all-day service, with reasonable travel times.

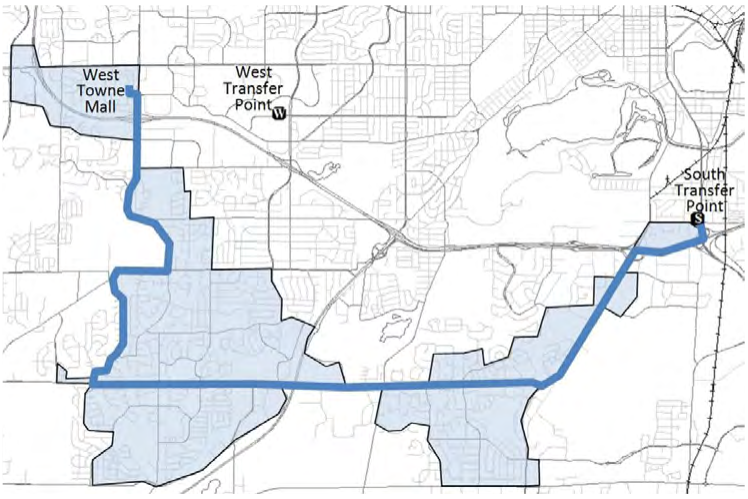


Figure 5-7: An example of route deviation.

Recommendations and Supporting Actions		Timeframe	Implementing Party
2	**Improve the local bus network.**		
A	Continue to optimize the local bus network to maximize its utility with available resources.	Ongoing	Metro, MPO
B	Measure and monitor the effects of service changes on low-income and minority populations.	Ongoing	Metro, MPO
C	Improve integration with bordering transit systems in Monona and Sun Prairie.	Ongoing	Metro, MPO
D	Reduce travel times and simplify service.	Ongoing	Metro
E	Expand and enhance the network of frequent local service in central Madison.	5-15 years	Metro
F	Make changes to local routes when BRT is opened in order to reduce duplication and enhance connections.	5-15+ years	Metro, MPO
G	Improve and expand data collection and analysis to support service planning.	Ongoing	Metro, MPO
3	**Add service in developing neighborhoods.**		
A	As developing neighborhoods are built out, enhance limited-service routes so that they provide regular service throughout the day.	Ongoing	Metro, Local governments
B	Add new all-day service in unserved peripheral neighborhoods and suburban communities such as Sun Prairie, McFarland, and Verona.	5-15+ years	Metro, Local governments
4	**Enhance transit stops with improved pedestrian/bicycle access and amenities.**		
A	Coordinate with municipalities, businesses, and neighborhood associations to plan and provide funding for stop improvements.	Ongoing	Metro, MPO, Local governments
B	Utilize TID funding and other alternative financing mechanisms to fund stop improvements.	Ongoing	Local governments
C	Plan and reserve space for transit stops/stations as part of new developments where appropriate.	Ongoing	Local governments
5	**Utilize alternative service delivery models to serve low-demand areas.**		
A	Analyze bus route productivity and identify service with low use and high travel times that may better serve neighborhoods with alternative transit models.	1-5 years	Metro, MPO
B	Develop peripheral routes with small vehicles that can deviate from their route with the goal of providing service in low density areas at a lower cost and reducing multiple-transfer trips.	1-5 years	Metro, MPO, Private Providers, Non-Profits
C	Investigate using transportation network companies and shared-ride taxi service to connect to transfer points, BRT, and regional express service.	1-5 years	Metro, MPO, Private Providers, Non-Profits
D	Plan for the use of driverless shuttles in low-density transit markets and niche areas like business parks and campuses.	1-5 years	Madison Traffic Eng, UW, Metro, MPO

Manage and improve the quality of transit capital assets. Aging infrastructure needs to be maintained and updated. Transit buses last 12 to 15 years and need to be regularly replaced. Metro's four transfer points were constructed in 1998 and will need to be replaced or in some cases relocated and/or expanded by 2050. Metro currently uses a diesel-powered fleet, about 10% of which is hybrid diesel-electric. Transitioning to a low-emission or emission-free fleet will reduce Metro's dependency on petroleum fuel, improve public health, air quality, and the pedestrian environment in bus route corridors. Metro is in the process of developing a comprehensive transit asset management plan in accordance with new federal rules. The plan must cover all transit agency assets, including vehicles, facilities, equipment, and other infrastructure.

Recommendations and Supporting Actions		Timeframe	Implementing Party
6	Maintain, expand, and enhance bus rolling stock and supporting facilities.		
A	Renovate and remodel the existing Metro maintenance/bus storage facility and address maintenance issues.	1-5 years	Metro
B	Build a new satellite bus facility on Nakoosa Trail to accommodate a larger fleet, including articulated buses and electric buses.	1-5 years	Metro
C	Replace buses on a regular cycle to ensure reliability and comfort.	Ongoing	Metro
D	Expand the use of alternative fuel vehicles with a goal of having a fully emission-free electric fleet by 2050.	Ongoing	Metro
E	Introduce articulated 60-foot buses to the fleet to reduce overcrowding and accommodate BRT.	5-15 years	Metro

Improve regional access to the transit network. Regional transit service in the Madison area is extremely limited with bus service confined to some of the contiguous municipalities bordering Madison and Verona. Workers living in DeForest, Windsor, Waunakee, Sun Prairie, Cottage Grove, McFarland, Stoughton, Oregon, and Cross Plains that work in the Madison area have effectively no public transit options outside of commuting to a park-and-ride lot or transfer point within Madison.

A new regional express service network will address the needs of people in these communities to commute to many jobs, particularly in central Madison. It will also provide access to people living within the existing transit service area to jobs in suburban employment centers. Employers in some of the communities have indicated they have difficulty filling entry level, lower wage jobs because of the lack of transit service. With direct, limited-stop service within Madison, the regional service will be time-competitive with driving and carpooling.

New park-and-ride lots will help supply passenger demand for the new regional express service. Many suburban communities are not well laid out for one route to serve all neighborhoods – many commuters will be best served if they have the option of making a short trip by auto or bicycle and using transit for the majority of their trip. Park-and-ride lots may be newly constructed, publicly owned lots, or private lots (e.g., at a shopping center) with lease agreements.

Recommendations and Supporting Actions		Timeframe	Implementing Party
7	Implement a regional express bus network.		
A	Expand and optimize the existing regional express service to Middleton and Verona.	5+ years	Metro, Local governments, MPO
B	Operate new routes primarily during the morning and afternoon peak periods to suburban Madison communities.	5-15 years	Metro, Local governments
C	Optimize the regional express transit service to provide service from Madison to suburban job centers as well as from residential areas to central Madison.	5-15 years	Metro, MPO, local governments
D	Provide limited stop service within City of Madison to provide fast service within Madison and connections to BRT and local service.	5-15 years	Metro, Local governments

Recommendations and Supporting Actions		Timeframe	Implementing Party
8	Expand park-and-ride facilities in conjunction with BRT and express services.		
A	Investigate opportunities to share space at shopping centers, churches, and other private facilities as well as public facilities such as parks, where appropriate. See Fig. 5-5, Planned transit System.	1-5 years	Metro, MPO, Local governments
B	Explore partnerships with local communities and agencies to maintain park-and-ride facilities.	1-5 years	Metro, Local governments

Implement a regional transportation entity to ensure financial solvency of the transit agency. A regional funding mechanism such as a regional transit authority with taxing authority is necessary to implement the vision of expanded transit service in the Madison region, including construction and operation of a bus rapid transit system and expansion of bus storage and maintenance facilities. A regional governance structure would also improve service efficiency and allow for more equitable decision-making.



Recommendations and Supporting Actions		Timeframe	Implementing Party
9	Implement a regional transit entity with stable funding and representative governance.		
A	Ensure that funding for transit remains equitable and that decisions are made fairly, with communities represented appropriately.	Ongoing	Metro, Local governments
B	Explore alternatives to supplement or replace the property tax for local public funding, including a vehicle registration fee and sales tax (if state enabling legislation passed).	1-5+ years	Local governments
C	Implement a new regional transit authority or district with the mission of providing regional transit service if state enabling legislation is passed.	1-5+ years	Metro, Local governments

BICYCLES

Although the region's bikeway network is well developed compared to peer communities, gaps in the network persist. Bicycle planners need to consider the needs of bicyclists of all abilities, including young and old people, and people who are not comfortable biking in traffic.

The 2015 Bicycle Transportation Plan identified streets that do not have bicycle accommodations or have insufficient bicycle accommodations. However, as these facilities are generally evaluated when opportunities arise, such as street reconstruction, they were not prioritized. This plan goes one step further and identifies missing facilities that represent major gaps and barriers in the bikeway network.





Expand the regional shared-use path network and retrofit and expand on-street accommodations. The Bicycle Transportation Plan describes a network of major regional shared-use paths that will connect communities with high quality biking infrastructure. Examples of regional paths include the popular Capital City Trail and Southwest Path. Although they are long and continuous, they also serve as high-volume bike arterials in the central city.

The Lower Yahara River Trail will open to the public in 2017 with a new bridge and boardwalk over Lake Waubesa, substantially shortening and easing a bicycle trip between Fitchburg or central Madison and McFarland. This new facility is planned to be extended about 10 miles south to Stoughton. The City of Madison and Dane County are working to close the gap between the Capital City Trail in Madison and the Glacial Drumlin Trail in Cottage Grove, creating a complete route between Madison and Milwaukee.

Other major recommended regional paths include the Good Neighbor Trail to Middleton and to the west, a path around the north side of Lake Mendota, a path between Fitchburg and Oregon with a connection to the Capital City Trail, a path between Madison and Sun Prairie along the rail corridor, and paths serving the north side connecting to Waunakee and DeForest. These paths will address the major regional deficiencies in the bike network, connecting neighborhoods and municipalities that are isolated for people traveling by bike.

On-street accommodations for bicycles are found on a number of regional roadways that serve high-volumes of motor vehicle traffic. In many instances, these facilities provide the most direct route to and from a variety of destinations. Providing safe on-street bicycle facilities ensure that more riders are able to comfortably ride on these regional roadways. The network should be expanded as roadway reconstruction projects occur and facilities should be considered whenever new arterial or collector streets are constructed.

Figure 5-8 illustrates and Figure A-2 in Appendix A lists the major regional priority shared-use path projects that will help complete the planned regional network and fill some important gaps in the network in the urban area. See page D-23 for a map of the complete bicycle network plan.

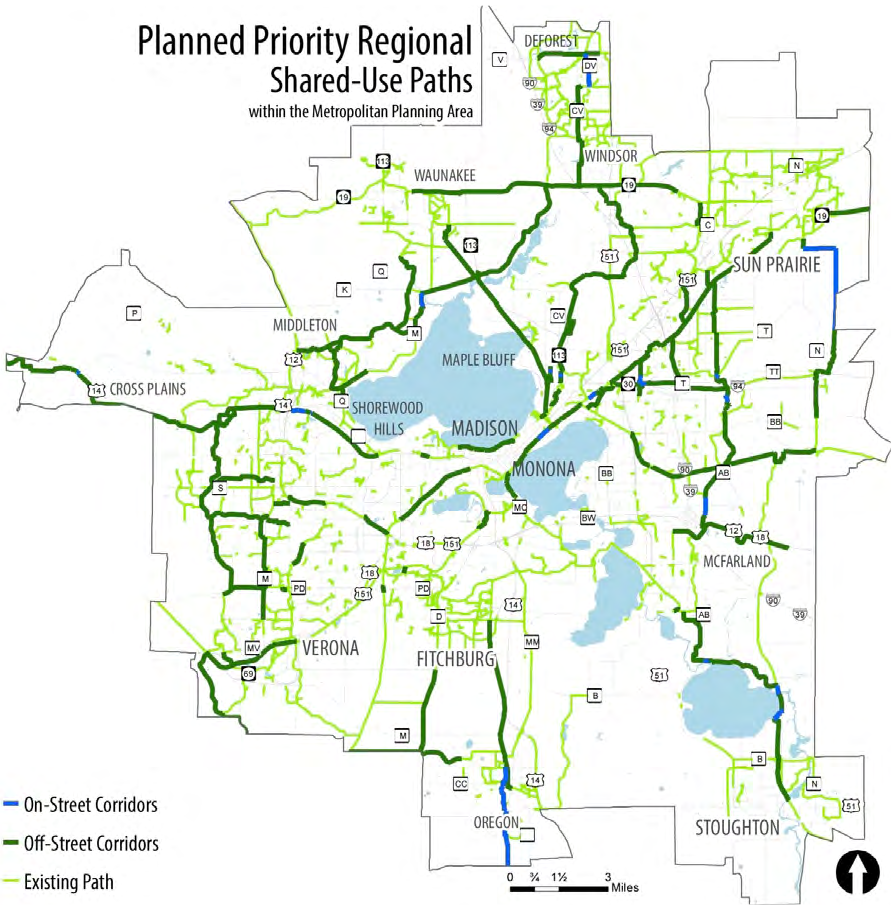


Figure 5-8: Planned Priority Regional Shared-Use Paths

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Expand the bikeway network with new shared-use paths and on-street facilities.		
A	Construct new off-street shared-use paths to complete the bikeway network envisioned in the Bicycle Transportation Plan.	Ongoing	Dane County, Local governments
B	Construct new shared-use paths in developing neighborhoods so that facilities are available as soon as new residents move in.	Ongoing	Dane County, Local governments
C	Retrofit existing corridors like railroad and utility rights-of-way with bicycle facilities as appropriate.	Ongoing	Local governments
D	Provide enhanced or premium bicycle facilities in key urban arterial corridors within right-of-way where feasible.	Ongoing	Local governments
E	Expand the use of bicycle boulevards, bicycle priority streets, and priority treatments at intersections.	Ongoing	Local governments
F	Prepare and implement local bicycle plans.	Ongoing	Local governments
G	Include paved shoulders of at least 4 feet in width on rural highways where appropriate and economically feasible.	Ongoing	WisDOT, Dane County
2	Maintain and modernize existing bicycle facilities.		
A	Repave and repair bicycle facilities with similar standards as collector streets.	Ongoing	WisDOT, Dane County, local governments
B	Include bicycle facilities on all new bridges and highway crossings.	Ongoing	WisDOT, Dane County, local governments
C	Use innovative bike facility designs that meet or exceed state and national guidelines.	Ongoing	Local governments
D	Develop and implement local policies and practices to clear snow, ice, and debris from bike facilities.	Ongoing	Dane County, Local governments

<u>Eliminate gaps and barriers in the bicycle network.</u>
Major facilities needed to complete the urban bikeway network are shown in Figure 5-9. The gaps and barriers analysis focused on urban areas that are fully developed and on identifying street and path corridors with existing demand for bicycling that can feasibly accommodate bicycle facilities when the opportunity arises. The analysis is intended to serve as an initial screening based on the existing and planned bikeway network.

A more detailed engineering evaluation is needed to determine how best to facilitate bicycles within the street corridors identified.

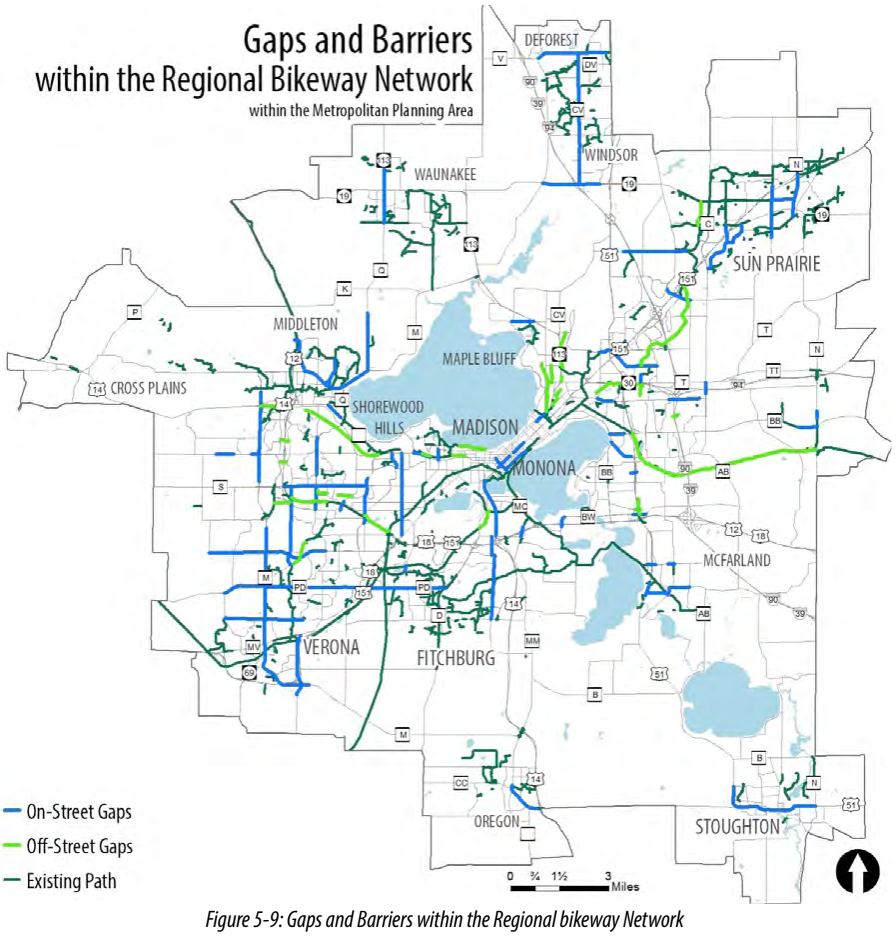


Figure 5-9: Gaps and Barriers within the Regional bikeway Network

While a detailed feasibility analysis of the identified corridors was not conducted, constrained street corridors with no available right-of-way and/or recently reconstructed streets are excluded.

The gaps and barriers are a occur in both on-street and off-street facilities. Fixing these gaps and barriers will help complete the bicycle route system envisioned in the Bicycle Transportation Plan. Figure 5-10 illustrates the planned primary regional route system.

Most of the on-street needs shown in the gaps and barrier map will likely be satisfied with bike lanes where none currently exist. Where feasible, these lanes may be buffered or protected.

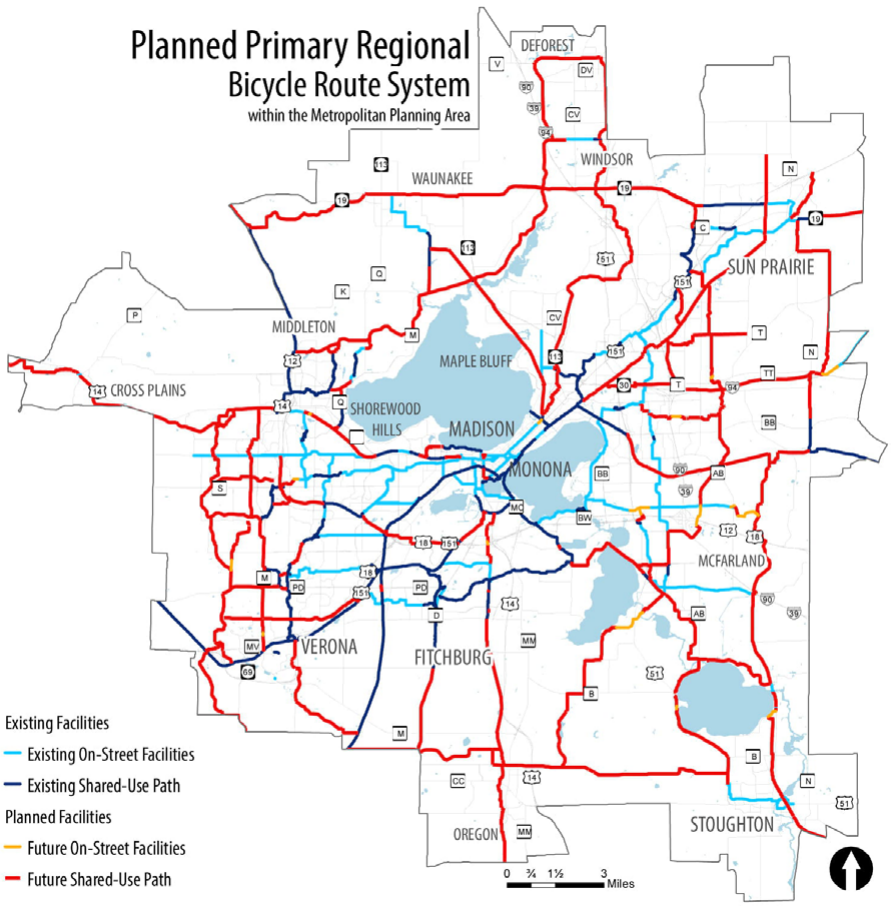


Figure 5-10: Planned Primary Regional Bicycle Route System

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	Eliminate bicycling barriers and hazards in the bikeway network.		
A	Close regional bikeway network gaps and address barriers (see Figure 5-9).	Ongoing	Dane County, Local governments
B	Evaluate intersections with a history of safety concerns or complaints, and plan and implement improvements.	Ongoing	WisDOT, Dane County, local governments
C	Complete the local street network where barriers prevent direct travel.	Ongoing	Local governments
D	Ameliorate conflicts between bikes and buses, delivery trucks, and pedestrians.	Ongoing	Local governments

Encourage bicycling by enacting bicyclist-supportive policies and ensuring bicyclist safety. To ensure that users of all abilities are comfortable using the bicycle network, appropriate facilities must be provided, but we must also ensure that both bicyclists and motorists are provided with ample education and encouragement. Also, intersections and corridors with high bicycle crash rates need to be studied to identify effective counter measures. These types of studies can also identify common patterns for crashes, which can be used to develop targeted education campaigns. Other user needs include adequate bicycle storage opportunities, access to bike sharing services, and adequate wayfinding.



Recommendations and Supporting Actions		Timeframe	Implementing Party
4	Provide adequate bicycle parking.		
A	Require bicycle parking as a condition of new development.	Ongoing	Local governments
B	Provide public bicycle parking in business districts, on campuses, and at high-use transit stations.	Ongoing	Local governments
5	Improve bicyclist safety through a "3E" approach .		
A	Conduct studies of intersections and other areas with high crash rates or documented safety issues to identify appropriate countermeasures.	Ongoing	Local governments, MPO
B	Update 1991 City of Madison study of vehicular crashes involving pedestrians and bicyclists, expanding it to the metro area, to obtain up-to-date information on common patterns for crashes. Utilize the information in crash prevention efforts.	1-5 years	MPO, City of Madison Traffic Engineering
6	Continue bike share, education, and bicyclist supportive policies.		
A	Continue supportive policies like producing bicycle maps and accommodating bicycle-themed events.	Ongoing	MPO, Local governments, NGOs
B	Implement wayfinding system for bicyclists using the recently developed Bicycle Wayfinding Design Guidelines for Dane County.	Ongoing	Dane County, Local governments
C	Expand the bike share program, working with the provider, by expanding the coverage and increasing the density of stations.	Ongoing	BCycle, Local governments
D	Support and expand education and encouragement programs that promote safety and encourage all residents to bicycle for commuting and other trips.	Ongoing	MPO, Local governments

PEDESTRIANS

Sidewalks are the preferred accommodation for pedestrians and provide many benefits, including safety, mobility, and healthier communities. Therefore, the pedestrian needs analysis started with identifying urban arterial and collector streets where sidewalks are missing from one or both sides, but are needed to serve existing development . This provided a starting point for prioritizing the most pressing needs. These street segments were then split into "Tier 1" and "Tier 2" categories.



Tier 1 sidewalk needs typically have a higher demand for walking based on the pedestrian walk access analysis (see Chapter 3) and are on streets with higher traffic speeds and volumes. Other qualitative factors were also considered. For instance, recently reconstructed streets and streets where a sidewalk is on one side, but most of the destinations are on the other side were generally put in the Tier 2 category. Figure 5-11 illustrates the Tier 1 and Tier 2 regional pedestrian network needs.

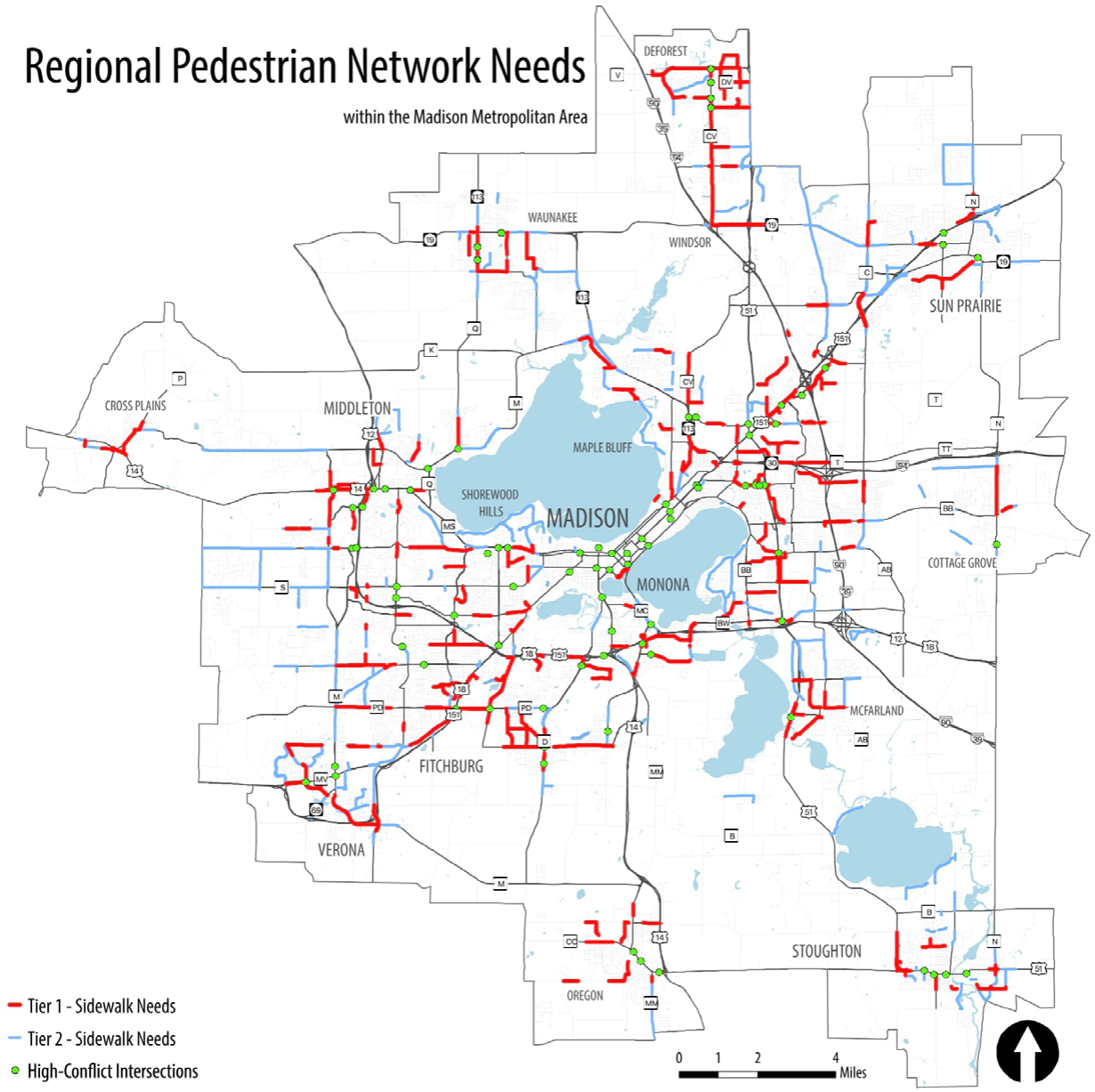


Figure 5-11: Regional Pedestrian Network Needs

Street crossing facilities such as curb ramps, crosswalks, and signals are the other major type of facility for pedestrians. Designing safe and convenient street crossings is extremely important for creating a pedestrian friendly environment. Appendix E includes a pedestrian toolbox that illustrates the different types of pedestrian facilities and treatments that can be used to encourage walking and provide for the safety of pedestrians. Of course, good facilities alone are insufficient without destinations within walking distance. Streetscape design is also an important part of creating walkable communities. Pedestrian-supportive land use is addressed above under Land Use and Transportation Integration. The following recommendations and supporting actions address the region's major pedestrian facility needs.

Construct sidewalks along all new urban streets and retrofit regional roadways with sidewalk accommodations. All urban streets that attract pedestrians normally benefit from having sidewalks.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Provide sidewalks and appropriate pedestrian amenities in developing neighborhoods.		
A	Require sidewalks on both sides of all streets in new urban developments.	Ongoing	Local governments
B	Adopt land use ordinances to ensure new developments provide for adequate pedestrian circulation and are integrated with adjacent land uses.	Ongoing	Local governments
C	Connect bordering, developing neighborhoods with sidewalks and shared-use paths.	Ongoing	Local governments
D	Prepare and implement local pedestrian plans.	Ongoing	Local governments
2	Retrofit regional streets with modern, safe pedestrian accommodations .		
A	Prioritize the addition of missing sidewalks on arterial and collector streets with higher demand for walking (See Fig. 5-11).	Ongoing	WisDOT, Local governments
B	Identify pedestrian needs and gaps, as well as safety problems, and implement solutions.	Ongoing	WisDOT, Local governments
C	Reduce cost share required of property owners to retrofit in sidewalks in existing neighborhoods.	Ongoing	Local governments
D	Prepare and implement ADA compliance plans to retrofit non-conforming facilities to ADA standards.	Ongoing	Local governments
E	Identify and install accessible pedestrian signal systems and other ADA accessibility treatments where necessary.	Ongoing	WisDOT, Local governments
F	Provide for a more comfortable pedestrian experience with wider sidewalks and appropriate separation on high-volume regional roads with pedestrian traffic.	Ongoing	WisDOT, Local governments

Improve the safety and usability of the pedestrian network. At the beginning and end of every trip, users of all modes are pedestrians. Thus, it is important to ensure a safe and usable pedestrian network. High conflict intersections should be examined to determine their need for pedestrian crossing improvements. The sidewalks should be maintained for year-round use, similar to roadways. In areas where roadway geometry and street designs cause unsafe pedestrian conditions, traffic calming devices should be installed to ensure pedestrian safety.

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	Improve safety and usability for pedestrians at intersections and crossings.		
A	Evaluate pedestrian improvements at major street crossings and implement as opportunities are available. See Fig. 5-11 identifying many of these high conflict locations.	Ongoing	Local governments, MPO
B	As intersections are designed and reconstructed, consider pedestrian safety improvements.	Ongoing	WisDOT, Local Governments
C	Use pedestrian design tools to improve crossings such as enhanced crosswalks, refuge islands, and rapid flashing beacons. See Pedestrian Facilities Toolbox in Appendix F.	Ongoing	WisDOT, Local Governments
D	Identify and prioritize new grade-separated crossings where streets and shared-use paths with substantial pedestrian traffic intersect with highways and other barriers.	Ongoing	WisDOT, Local Governments
4	Maintain sidewalks and pedestrian facilities for year-round use.		
A	Provide and enforce snow removal policies, particularly around intersections and bus stops.	Ongoing	Local Governments
B	Implement program to identify and repair broken and substandard sidewalks.	1-5 years	Local Governments
5	Design new streets and retrofit existing streets to reduce speeding.		
A	Ensure that local street standards do not require unnecessarily wide streets.	Ongoing	Local Governments
B	Retrofit existing overly wide streets to reallocate space for other uses as part of reconstruction.	Ongoing	WisDOT, Dane County, Local Governments
C	Incorporate traffic calming features into new local streets where appropriate.	Ongoing	Dane County, Local Governments
D	Implement traffic management programs to address speeding and cut-through traffic problems on existing streets.	Ongoing	Dane County, Local Governments

INTER-REGIONAL TRAVEL

In an increasingly connected world, inter-regional travel must be maintained and expanded. While intercity-bus options are currently available, buses lack a common terminus and often lack good connections to local bus routes. Further, inter-city passenger rail service is unavailable.

Construct an inter-city transit hub. The lack of a centralized inter-city bus terminal is the most immediate need for inter-regional travel by bus. A new facility needs to be centrally located with convenient access to the University of Wisconsin campus as well as downtown Madison. A modern, attractive facility would feature ticket sales and other amenities for passengers. Several of our nearby cities - Milwaukee, Saint Paul, La Crosse, Grand Rapids, and Champaign-Urbana - have terminals that are well located and designed to maximize rider access and comfort.

While a new inter-city bus terminal would initially only serve buses, consideration should be given to future rail service to ensure convenient integration with existing and future services. Inter-city bus operators should be able to reliably access the new terminal without regular interference from traffic and other delays. Further, convenient connections to local transit service should be available.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Build an inter-city bus terminal.		
A	Construct a new high-quality inter-city bus terminal in central Madison.	5-15 years	City of Madison
B	Ensure the new facility has convenient access to downtown Madison and the UW.	5-15 years	City of Madison, UW
C	Ensure that passengers can conveniently transfer to BRT and local buses.	5-15 years	City of Madison, Metro

Support improved inter-city transit. Madison is well-served by inter-city bus service, still, several gaps remain. Demand for travel to the Twin Cities will likely support far more service than is currently provided by the several daily round trips provided by Megabus, Greyhound, and Jefferson. More frequent buses, particularly on the express routes, would make the bus a more attractive alternative to driving. Increased frequency to northeastern Wisconsin is also needed. Only one daily round trip links Madison to Fond du Lac, Oshkosh, Appleton, and Green Bay. The population served by this route would be better served by several daily round trips. Additionally, bus service to Iowa (Dubuque, Davenport, Des Moines, etc.), Omaha, St. Louis, and Kansas City are inconvenient. Improved service could consist of new, longer routes with direct service to these cities, increased frequency, and better connections.

Until passenger rail service is available in Madison, increased access to Amtrak must be provided by increasing the frequency of inter-city service and connectivity to Amtrak stations. Thruway bus service currently provides an extension of Amtrak rail service to Madison. Connections to south and east coast trains in Chicago are convenient with frequent service to Chicago Union Station, but connections to west coast trains like the Empire Builder, California Zephyr, and Southwest Chief may require out-of-direction travel or long waits.

Recommendations and Supporting Actions		Timeframe	Implementing Party
2	Support new and improved inter-city bus service.		
A	Improve service frequency to Minneapolis / St Paul and Appleton / Green Bay.	1-5 years	WisDOT, Private Providers
B	Improve connections to Amtrak services.	1-5 years	WisDOT, Private Providers
C	Provide direct service to Davenport, Des Moines, Omaha, and other cities to the west.	1-5 years	WisDOT, Private Providers

Implement inter-city high-speed passenger rail service. Prior to 2010, an expansion of the popular Amtrak Hiawatha Service was planned to downtown Madison. The service would have had seven trains per day departing Madison, arriving in Chicago with stops in Milwaukee and other cities in between. This project was awarded federal stimulus funds, however, the funds were returned prior to construction.

Planning for inter-city high-speed passenger rail service should not be abandoned. Corridor acquisition and preservation will ensure viability of the service if and when the service becomes politically viable. The project should be as close to "shovel-ready" as possible, with planning efforts finalized and local political support maintained. When rail improvements are needed along previously identified corridors, considerations should be made for the types of improvements that will be compatible with future passenger service.

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	Maintain and preserve the rail network for future passenger rail service.		
A	Identify inter-city passenger rail routes to Milwaukee, Chicago, and Minneapolis / St Paul.	15+ years	WisDOT
B	Identify station locations for passenger rail service.	15+ years	Local Governments, Metro MPO, Dane County, WisDOT

SPECIALIZED TRANSIT

Specialized transit service is coordinated through a variety of services that aim to meet the transportation needs of seniors and disabled individuals. The Dane County Coordinated Public Transit – Human Services Transportation Plan, updated in 2013, provides details on existing services and service and coordination needs. The following highlights some of these needs and recommendations to address them.



Expand the coverage of accessible fixed-route, paratransit, and on-demand taxi services. The expansion of public all-day fixed-route bus service into unserved neighborhoods in peripheral parts of Madison and neighboring communities like Verona, Monona, and Sun Prairie will substantially increase mobility for people with special needs. The new routes utilize accessible buses and automatically increase the paratransit service area. For those without access or the ability to use fixed-route service, paratransit service must continue to expand. Wheelchair accessible taxi service is currently only provided by one taxi company and the cost to provide the service is high, particularly given the intense competitive pressure facing traditional taxi companies with the rapid growth of Uber and other transportation network companies. In order to maintain this service in the future, costs will need to be spread across providers.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Expand the coverage of accessible fixed-route bus and paratransit service and address other identified service related needs.		
A	Implement the recommendations in the Transit Development Plan and address needs identified in the Dane County Coordinated Public Transit - Human Services Transportation Plan	Ongoing	Metro, MPO
B	Explore opportunities to expand paratransit and accessible shared-ride taxi service in urban areas beyond the fixed-route bus service area	5-15 years	Metro, MPO, Dane County
2	Work collaboratively with private taxi operators to ensure accessible taxi service is available and costs for the service are shared equitably.		
A	Work collaboratively with private taxi operators to ensure accessible taxi service is available and costs for the service are shared equitably	Ongoing	MPO, City of Madison, Private Taxi Operators, Non Profits

Continue and expand work-based transportation for low-income workers. Low-income workers will continue to struggle to find reliable ways to get to work and help drive the economy. The YWCA's JobRide program plays a crucial role in filling this niche when public transit options are not available or practical. However, demand for the service exceeds budgetary and physical capacity of the system, and as outlying communities grow, demand will as well.

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	Continue and expand specialized work-based transportation for low-income people.		
A	Work with the non-profit organizations to ensure funding remains available for people to get to work who don't have traditional options.	Ongoing	MPO, City of Madison, non-profit organizations
B	Continue to maximize efficiency by optimizing vehicles and timetables.	Ongoing	Non-profit organizations

Leverage emerging technologies to lower specialized transit operating costs while expanding service availability. Emerging technologies, such as ridesharing services and autonomous vehicles, provide both challenges to existing service delivery methods and opportunities for the future. New technologies that offer proven benefits should be incorporated into the transportation system, and accompanied by supportive policies.

Recommendations and Supporting Actions		Timeframe	Implementing Party
4	Utilize emerging technologies to lower operating costs and expand travel options.		
A	Modify policies as needed to ensure that autonomous vehicles can adequately serve seniors and people with disabilities.	5-15 years	MPO, City of Madison, WisDOT

Continue efforts to better coordinate specialized transit service. The City of Madison and Dane County coordinate successfully, minimizing service duplication. However, with the numerous public and private agencies and programs providing service there are still major coordination needs as documented in the Dane County Coordinated Public Transit – Human Services Transportation Plan. This includes coordinating transit services as well as job training, eligibility requirements, and funding. In addition, local communities should consider transit service availability when sighting senior housing, medical facilities, and other services.

Recommendations and Supporting Actions		Timeframe	Implementing Party
5	Improve interagency coordination of the various specialized transit services and private services.		
A	Plan for the advent of Family Care in Dane County, including for IRIS (self-directed services) members to prevent cost-shifting to Metro Transit.	Ongoing	MPO, City of Madison, Metro Transit
B	Improve coordination of medical trips, including inter- and intra-community trips and from surrounding counties.	Ongoing	City of Madison, WisDOT

TRANSPORTATION DEMAND MANAGEMENT

Maximizing the use of alternative modes and reducing the number of people driving alone can improve air quality, congestion, and the quality of neighborhoods. Transportation Demand Management (TDM) strategies make alternatives to driving more appealing and increase awareness of the available options. TDM programs rely upon a robust transit, bicycle and pedestrian network, and support for ridesharing. Land use decisions and parking strategies also impact the viability of these alternatives.

Expand the regional network of park-and-ride lots to encourage carpooling, transit use, and bicycling. For commuters traveling between communities facilities and services such as park-and-ride lots and vanpools offer options for trips that are not able to be fully served by transit and bicycle infrastructure. Dane County currently has twelve park-and-ride lots but only five offer transit service. Park-and-ride usage could be expanded by increasing the number of lots with that have transit service, preferably limited-stop service, and are located on the bikeway network. To create more park-and-ride lots that serve a variety of transportation modes will require the cooperation of multiple government agencies to ensure the lots are in easily accessible locations and meet the needs of different commuters. Figure 5-12 shows existing and planned park-and-ride lots.

Expand the vanpool program. Currently, the vanpool program primarily serves commuters traveling into downtown Madison and the UW from communities outside of Madison. The State of Wisconsin Vanpool Program is limited by both the destinations it serves and by the hours it travels. In addition, only a limited number of vans are available and all vanpools must include a state employee. Another van service operated by the YWCA called the YW Transit JobRide offers service in the Madison area. The JobRide service provides rides to areas that aren't served by transit and to those that are inaccessible during non-peak transit hours, including nights, weekends, and holidays. The service provides an important complement to the public transit system, but funding it continues to be a challenge and it currently has a waitlist. Expansion of these services will increase options for travel that is hard to serve with transit, bicycling or walking.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Expand the regional network of park-and-ride lots to encourage carpooling, transit use, and bicycling.		
A	Explore partnerships with local communities and agencies to develop park-and-ride facilities.	1-5 years	WisDOT, Dane County, Local governments
2	Expand the state vanpool program and support development of additional vanpool programs.		
A	Support expansion of WisDOA vanpool program and development of additional vanpool programs.	5-15 years	WisDOA, WisDOT, Local Governments, Non-Profits, Private Providers

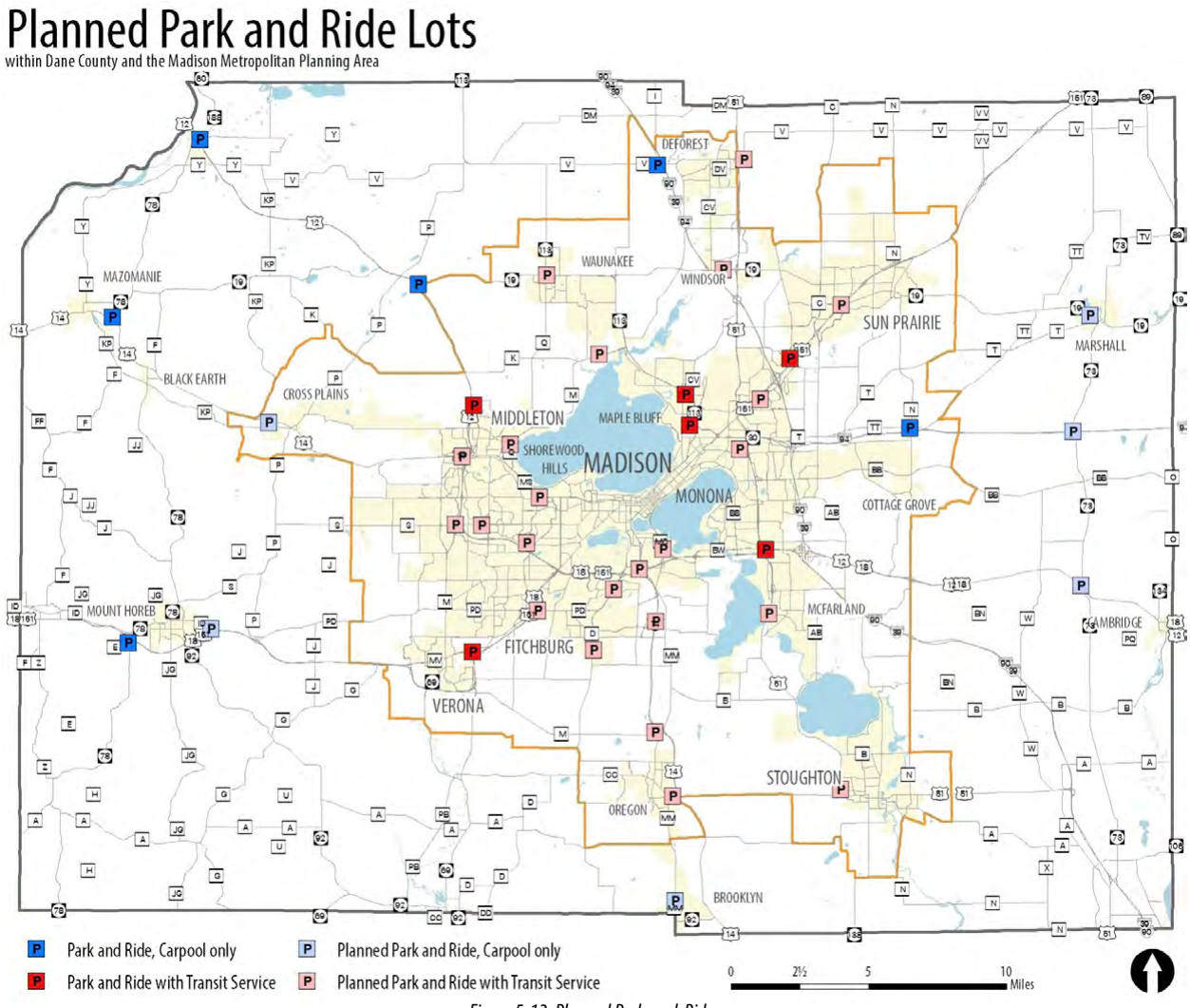


Figure 5-12: Planned Park-and-Rides

Continue to encourage and provide support to large employers, institutions, and municipalities to develop and promote strategies to reduce single-occupant motor vehicle trips. The Madison area has a well-established TDM program, Rideshare Etc., which supports businesses and other institutions to encourage reduced driving. One aspect of the program is the online Rideshare Etc. website, which provides a way for anyone to search online for options, including potential carpool partners. The Rideshare Etc. website is just one resource of the current program, which also includes a Guaranteed Ride Home program and a small marketing program. These current programs form a foundation for the expansion of TDM efforts in the region.



To foster the development of TDM initiatives in the region, local municipalities should develop clear requirements for a TDM plan as a condition of approval for large commercial developments. These requirements should include specific criteria and standards to be met, and provide support for their development and implementation. The establishment of Transportation Management Associations (TMA) in larger employment centers can help businesses meet these requirements. TMAs serve the needs of employers and employees within a business district, industrial park or other area by providing support, promotion, and advocacy for improved transportation policies and opportunities. These efforts will also support strategies such as telecommuting and alternative work schedules that can also help manage congestion.

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	Continue to encourage and provide support to large employers, institutions, and municipalities to develop and promote strategies to reduce single occupant motor vehicle trips.		
A	Support establishment of Transportation Management Associations in major employment centers.	1-5 years	MPO, Local governments
B	Encourage and provide assistance to local communities interested in requiring TDM plans as a condition of approval for large commercial developments, with specific criteria and standards for such plans.	1-5 years	Local governments, MPO
C	Continue to encourage telecommuting and alternative work schedules.	Ongoing	Local governments, MPO

Provide financial incentives for people to use alternative transportation, and increase funding for marketing programs. Financial incentives are among the most effective TDM strategies. The cost and limited availability of parking in the downtown/UW areas is a significant factor in limiting single-occupancy vehicle (SOV) commuting. The advent of unlimited ride pass programs at UW and Madison College have also contributed greatly to increased transit ridership in the past 10+ years. Metro's Commute Card program continues to expand, and a number of businesses track employee commute modes to offer rewards for biking, walking,

taking transit or ridesharing. To continue progress in reducing SOV commuting, it will be important to expand employer participation in Metro's Commute Card program, parking cash-out programs, and other incentive programs. In addition, users of alternative modes will need support programs such as the Guaranteed Ride Home program and occasional parking programs to ease the transition from driving alone. In addition, encouragement programming and marketing efforts will need to be undertaken to ensure that people are aware of their options, especially individualized marketing programs such as a the Love to Ride and Smart Trips programs. These individualized marketing programs are designed to work with people to find solutions that work for their situations and to provide them with the support and resources they need to make incremental changes in their travel behavior.



Recommendations and Supporting Actions		Timeframe	Implementing Party
4	Provide financial incentives for people to use alternative transportation and increase funding for marketing programs.		
A	Continue efforts to expand employer participation in alternative transportation incentive programs such as Metro's Commute Card program, parking cash-out programs, or other financial reward programs.	Ongoing	MPO, Metro, Local Governments
B	Increase funding for support services such as Guaranteed Ride Home, occasional parking programs, and marketing of the programs.	1-5 years	MPO, Dane County, Local Governments
C	Increase funding for advertising and marketing programs, including individualized marketing programs such as Love to Ride and SmartTrips.	1-5 years	MPO, Dane County, WisDOT, Metro

Support transportation options at schools through Safe Routes to School (SRTS) programs. Auto congestion around schools affects traffic flow, air quality, and safety for bicyclists and pedestrians. Safe Routes to School programs encourage more families to walk and bike to school, and work to ensure everyone's safety near schools, particularly in student drop off/pick up areas. SRTS programs also help to increase physical activity in children and support healthy habits for the future. Since the inception of the federal SRTS program many communities in the region have undertaken SRTS projects to improve bicycling

and walking conditions at and around their schools. However, sustainable funding for these efforts is needed to ensure the continued survival and expansion of these programs. Sustainable funding, along with a regional approach to SRTS, will help establish walking and bicycling to school as a safe and efficient way for families to travel to school and help improve students' health.



Recommendations and Supporting Actions		Timeframe	Implementing Party
5	Support transportation options at schools through Safe Routes to School programs.		
A	Secure sustainable funding for a regional Safe Routes to School program, utilizing resources such as mini-grants, CIP funding, local operating budget funding, private funding, and/or federal funding.	1-5 years	MPO, Non-Profits, School Districts, Local Governments
B	Develop and implement a regional Safe Routes to School program.	1-5 years	MPO, Non-Profits, School Districts, Local Governments

TSM, OPERATIONS, AND ITS



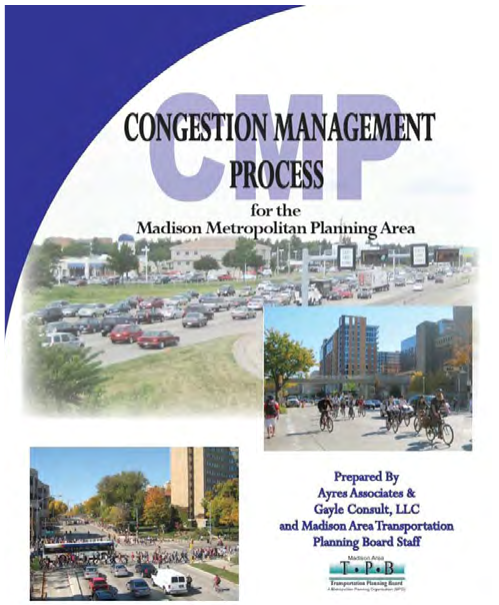
Congestion is caused when the demand for a transportation facility approaches or exceeds the capacity of the roadway. The result of a roadway reaching this condition is slower travel speeds, longer trip lengths, and the potential for vehicle queuing when entering or exiting the roadway. Typically, recurring congestion is common during the morning and afternoon rush hour periods on heavily traveled regional roadways. This type of congestion is generally predictable, understood, and accepted by motorists. However, non-recurring congestion caused by construction, crashes, bad weather, and other incidents can lead to unexpected delays and unanticipated travel-time variability. Complicating things, these sources of congestion can trigger secondary events, such as a weather event causing a crash or a special event near a construction zone causing extreme delay. Research has shown that these non-recurring causes contribute to close to half of all congestion. Reliability issues are often more frustrating than congestion, causing commuters to be late for work, buses to run late, and freight to miss delivery windows.

Major capacity expansion projects, such as adding additional lanes, are often not feasible or desirable because of the cost and negative impacts to the environment, residents' quality of life, and other roadway users. However, actively managing the transportation system to improve traffic operations can increase the capacity of a roadway without constructing new lanes. Transportation system management (TSM) includes strategies such as improved traffic signal operations, management of roadway incidents, traveler information, and focused roadway modifications to provide bottleneck relief. Intelligent Transportation Systems (ITS) – sensors, computers, communications systems that allow multiple agencies to work together – can aid these TSM strategies. Even for roadways that will eventually need additional travel lanes, TSM can delay the need for



capacity expansion. After expansion, TSM strategies can help to maximize the value of new capacity. In short, TSM, including ITS, is about maximizing the value of transportation infrastructure.

<u>Update and Implement the Congestion Management Process</u>.
To minimize congestion for all transportation modes and reduce unexpected delay, MATPB has adopted a comprehensive congestion management process (CMP). The CMP prescribes comprehensive transportation system management and operations strategies to ensure the most efficient use of resources and minimum environmental impact. The efficacy of this process is determined in part by an annual performance measurement and monitoring process. The first performance measure report was published in 2016.



In the future, MATPB will refine the CMP to ensure that the process is serving its intended purpose. This includes refining data collection techniques for CMP-recommended performance measures, and ensuring that CMP processes are contemporary compared to that of peer cities. While still legally valid, the process should be updated to reflect changing regional needs, trends, and technologies.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Implement and periodically update the adopted Congestion Management Process.		
A	Continue and improve monitoring of system performance, including post-construction project impact evaluation, utilizing the methodology outlined in the plan.	Ongoing	MPO, Dane County, Local goverments, WisDOT
B	Identify, prioritize, and implement corridor and intersection TSM projects to improve traffic and transit operations and safety on the arterial roadway system.	Ongoing	MPO, WisDOT, Dane County, Local Governments
C	Investigate the feasibility, benefits, and costs of an expanded incident detection and response program for additional state roadways (e.g., Verona Road) and selected local arterials.	1-5 years	WisDOT, Dane County, Local Goverments, MPO
D	Update the CMP to account for new federal rules, data sources, and MPO resources.	1-5 years	MPO

Improve the operation of the transportation network by improving roadway access. Access to and from a roadway is valuable to landowners on adjacent parcels – be it retail establishments, industrial uses, or residential properties. Access points can have a major impact on roadway operations. Land use adjacent to regional roadways should be planned in a way that is consistent with roadway function and geometry. Access should be examined on existing facilities and consolidated, when appropriate.

Recommendations and Supporting Actions		Timeframe	Implementing Party
2	Implement access management plans and standards for existing and planned future arterial roadways as development and street (re)construction occur.		
A	Initiate access management plans on congested corridors as development and street reconstruction occur	1-5 years	MPO
B	Develop a regional access management plan that identifies standards for future arterials roadways, best practices, and safety considerations	1-5 years	MPO

Modernize the transportation network through the use of technologies that improve the operations of existing infrastructure. The operation of the transportation system can be impacted not only by roadway design, but by technologies that modify traffic flow and provide information to influence traveler behavior. In terms of importance, neither method can be understated. To plan for and coordinate future operational improvements, MATPB adopted the first Regional Intelligent Transportation Systems Strategic Plan in early 2016. This plan contains a prioritized list of recommended projects, as well as strategies to guide plan implementation. The plan should be implemented and updated as needed.

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	Modernize the multimodal transportation network using technology.		
A	Include as part of new urban roadway projects infrastructure for connected and autonomous technologies, where appropriate.	Ongoing	WisDOT, Dane County, Local governments
B	Replace obsolete traffic signal controllers with “smart" controllers when replacing traffic signals or constructing new signalized intersections.	Ongoing	WisDOT, Local governments
C	Implement adopted process to identify and integrate ITS infrastructure into planning and design of major state roadway projects.	Ongoing	WisDOT
4	Implement and periodically update the Regional Intelligent Transportation Systems Strategic Plan.		
A	Continue planning efforts to advance the recommendations listed in the ITS plan .	Ongoing	WisDOT, Dane County, Metro, Local governments
B	Continue to engage with the ITS Plan Implementation Subcommittee to facilitate cooperation and coordination among state and local agencies.	Ongoing	MPO
C	Continue efforts to provide comprehensive real-time traveler information to people and businesses.	Ongoing	WisDOT, City of Madison
D	Implement a smart card payment system that can be expanded to include a common fare media for other civic uses, as well as an open payment system that accepts fares using personal electronic devices.	1-5 years	Metro

FREIGHT, AIR, AND RAIL

Freight, air, and rail access improve the financial condition of area residents and businesses alike. Policies related to these modes should be designed to enhance the financial interests of all in the region.

Increase the local focus on freight planning. Freight interests should be incorporated into local planning efforts to ensure promotion and preservation of freight uses along freight corridors and targeted expansion of freight-related infrastructure.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Maintain and promote new industrial uses along freight corridors.		
A	Work with stakeholders to determine significant transportation issues that negatively impact freight focused businesses within the region.	1-5 years	MPO, WisDOT
B	Work to cluster similar industrial uses to promote efficiency of the freight network.	Ongoing	Local governments
2	Maintain and expand infrastructure on the multimodal freight network, prioritizing projects that improve safety and efficiency, and minimize lifetime costs.		
A	Investigate and implement vehicle-to-infrastructure technologies to increase safety along freight corridors.	1-5 years	WisDOT, Dane County, Local governments
B	Investigate and implement vehicle-to-infrastructure technologies that reduce delay for passenger and freight vehicles in freight corridors.	1-5 years	WisDOT, Dane County, Local governments
C	Investigate ways in which new technologies, such as 3D printing, may impact the demand for future transportation facilities when planning improvements to the network.	1-5 years	WisDOT, Dane County, Local governments
D	Continue enforcement of truck weight regulations to reduce premature deterioration of roadways and bridges.	Ongoing	WisDOT
3	Increase focus on freight planning for regional and local transportation facilities.		
A	Continue to incorporate freight considerations into corridor and planning studies.	Ongoing	WisDOT, Dane County, Local governments
B	Plan for and implement recommendations from the Wisconsin State Freight Plan.	Ongoing	WisDOT, Local governments
C	Ensure local and regional freight-centric projects are listed in Wisconsin State Freight Plan to maintain eligibility for enhanced federal matching funds.	1-5 years	WisDOT, Dane County, MPO, Local governments
D	Consider first and last mile(s) implications for freight when approving site plans for freight focused facilities.	Ongoing	Local governments

Mitigate rail conflicts while maintaining the viability of rail service. Safety concerns at rail crossings should be studied and remedied with the help of private rail operators. Land use conflicts, such as rail crossings in residential areas, should be mitigated through the use of improvements that allow designation of "quiet zones." Rail corridors should be acquired when abandoned to preserve the corridors for future freight and passenger rail service, and other transportation uses. Further, governmental agencies should work with private operators to accommodate heavier loads at higher speeds.

Recommendations and Supporting Actions		Timeframe	Implementing Party
4	Maintain the availability of rail facilities for current and future uses.		
A	Preserve rail corridors for freight uses, acquiring excess land when available to ensure availability for future transportation uses.	Ongoing	WisDOT, Rail Transit Commissions
B	Replace ties, ballast, and jointed rail with modern materials to accommodate heavier loads and higher speeds.	Ongoing	WisDOT, Rail Transit Commissions, Private Operators
C	Plan for improvements to accommodate high speed, high volume passenger service on routes to Milwaukee, Chicago, and St Paul, such as positive train control, double-tracking, and electrification.	15+ years	WisDOT
5	Mitigate conflicts between rail and other uses		
A	Identify high-conflict rail crossings and mitigate conflicts, when possible.	Ongoing	WisDOT, Dane County, Local Governments
B	Continue to implement quite zones in residential neighborhoods within urbanized areas.	Ongoing	Local Governments
C	Work with rail companies to grade-separate high-use rail crossings.	Ongoing	WisDOT, Dane County, Local Governments

Ensure compatibility of land use planning near airports. The area in which an airport operates is often subject to a number of negative externalities such as increased noise, light, and air pollution. Care should be taken to ensure compatibility of land uses by accounting for existing and future airport master plans in development of local comprehensive plans. Further, the airport master plan should account for future land use plans encapsulated in local comprehensive plans.

Recommendations and Supporting Actions		Timeframe	Implementing Party
6	Ensure compatibility of uses near airports.		
A	Ensure land use plans within airport influence areas are compatible with existing and planned airport plans.	Ongoing	Local Governments
B	Ensure Airport Master Plans consider existing and future uses identified in community comprehensive plans.	Ongoing	Dane County
C	Continue to implement the Airport Master Plan.	Ongoing	Dane County
7	Improve airport facilities to enhance usability and convenience for passenger traffic.		
A	Improve connections to the airport for all modes of transportation, including increasing frequency and speed of transit connections between Dane County Airport, downtown Madison, and the UW campus.	Ongoing	WisDOT, Dane County, Metro, Local Governments
B	Consider how future transportation technologies may influence the way that passengers travel to and from airports when building new parking lots and passenger pickup/drop off facilities.	1-5 years	MPO, Dane County, Local governments

Improve airport accessibility for passenger flights and freight. Accessibility to Dane County Regional airport should be improved by all modes, specifically transit. Consideration of future technologies, such as autonomous vehicles, should be made before embarking on major parking enhancement projects. Freight-related facility accessibility should be improved as needed for local businesses.



Recommendations and Supporting Actions		Timeframe	Implementing Party
8	Improve airport facilities freight accommodations and connections		
A	Survey businesses to determine if Dane County Airport is adequately serving their needs and determine what could be done to improve service.	1-5 years	Dane County
B	Contact freight shippers operating out of Dane County Airport to determine if needs are being met with current facilities and identify improvements that must be made for future success.	1-5 years	MPO, Dane County, Local governments
C	Survey local businesses to determine if air freight needs are being met and what types of improvements would improve business viability.	1-5 years	MPO, Dane County, Local governments

PARKING

Adequate parking is necessary for the vibrancy and vitality of urban areas. It fosters economic activity in retail shopping and entertainment districts and ensures the success of business and office areas. However, over-constructing parking can lessen these advantages while discouraging users to rideshare, take transit, walk, or bike to their destinations. This modal diversion can lead to increases in congestion in already congested parts of the region. Further, emerging technologies may impact the need for parking facilities.

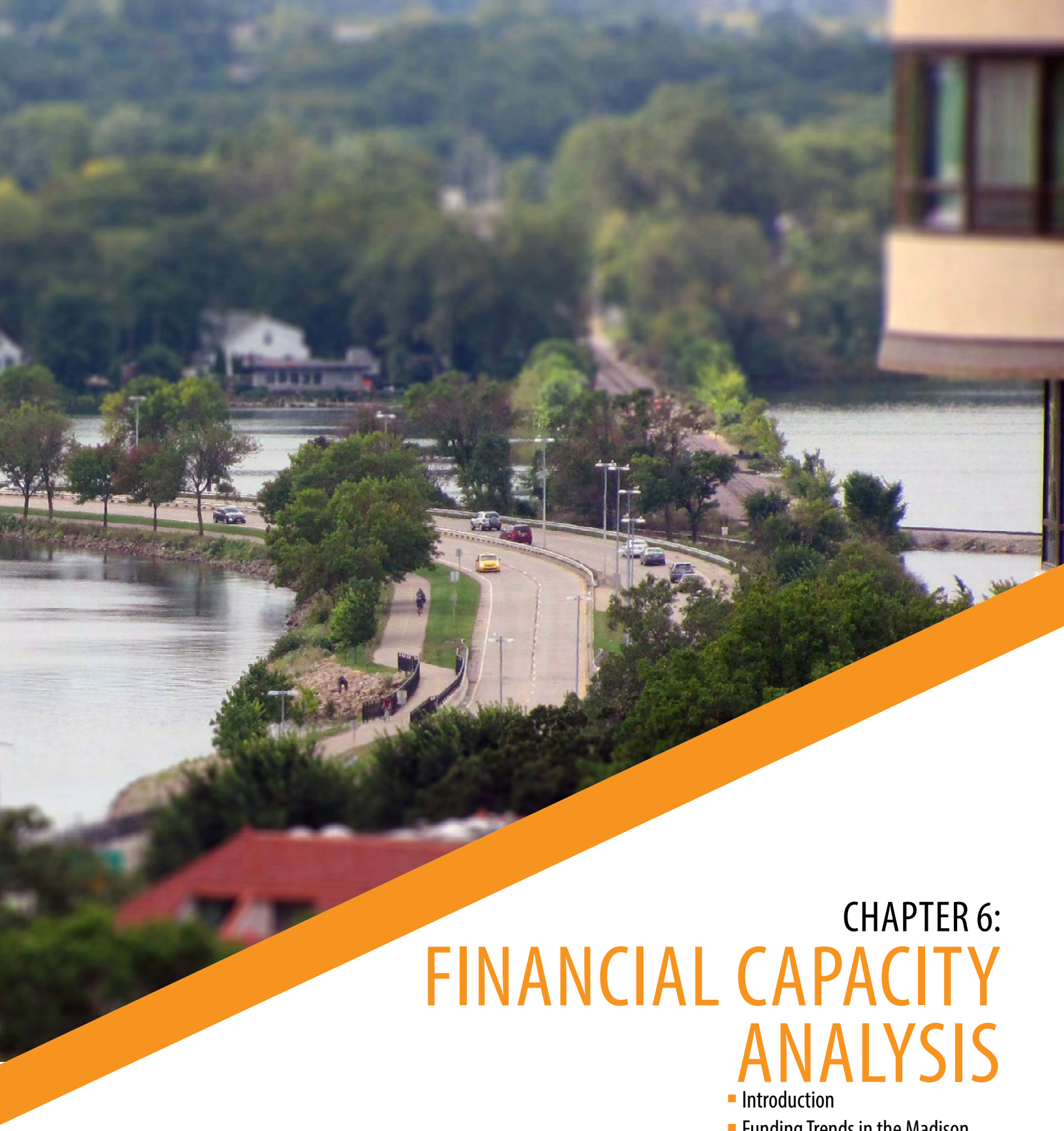
Use parking management strategies to reduce congestion and encourage multi-modalism. Strategically managing parking availability will ensure vibrancy of areas while encouraging multi-modalism. Such strategies may include demand-responsive pricing, where parking fees are higher when parking is most in demand. Local governments should also consider revising parking requirements to allow developers to determine the need for parking based on market demand, while avoiding shortages that may result in parking spillover in surrounding areas. Parking requirements and policies that reduce excessive parking are particularly important in downtowns and other mixed-use activity centers. In a recent update to its zoning code, the City of Madison removed nearly all parking minimums in non-residential districts, and for some residential areas only requires site plans showing where parking could be provided if needed in the future. Parking minimums had not been applied in the downtown for quite some time.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Use parking management strategies to reduce congestion within downtown areas and major activity centers.		
A	Develop and implement a downtown Madison parking management plan.	1-5 years	City of Madison
B	Implement technologies and associated policies, such as demand responsive pricing, that increase access and convenience to parking, and reduce vehicle idling and circling to find parking.	5-15 years	Local governments
C	Encourage ridesharing by developing and implementing policies that reduce parking rates and/or provide preferential parking spots to carpools and vanpools.	1-5 years	Local governments
2	Modify parking requirements to encourage multi-modalism, using a more market-based approach while addressing potential spillover impacts.		
A	Review minimum parking requirements to ensure an appropriate balance between parking needs and continuity of the built environment.	1-5 years	Local governments
B	Allow deviation from parking minimums, particularly in dense urban areas, to accommodate innovative project designs that maximize access to alternative modes of transportation and incorporate TDM strategies.	1-5 years	Local governments

Ensure the flexibility of existing and future parking facilities to accommodate future technologies. Emerging technologies, such as ridesharing and autonomous vehicles, have the potential to reduce and/or change the demand of parking facilities. New facilities should be constructed in a way that allows their conversion to other uses, and existing facilities should be evaluated for other uses when reaching the end of their viability.



Recommendations and Supporting Actions		Timeframe	Implementing Party
3	Ensure flexibility of parking facilities to accommodate future technologies.		
A	Ensure that streets are designed with future flexibility in mind and that parking policies allow for conversion to loading zones if/when autonomous vehicle technologies are implemented.	1-5 years	Local governments
B	Ensure new parking structures are designed to allow for conversion to other uses if/when autonomous vehicle technologies are implemented.	5-15 years	Local governments



CHAPTER 6: FINANCIAL CAPACITY ANALYSIS

- Introduction
- Funding Trends in the Madison Metro Area
- Projected Revenues Through 2050
- Projected Expenses Through 2050
- Conclusion

INTRODUCTION

Federal transportation planning rules require that regional transportation plans include a financial capacity analysis to demonstrate that the plan is fiscally constrained. That is, it must be demonstrated that the estimated costs of recommended projects in the fiscally constrained plan and maintenance of the existing transportation system can be covered using available and projected revenue sources. If projected funding shortfalls exist, new sources of revenue must be identified. In other words, the plan cannot simply be a wish list of projects. This requires prioritizing potential projects, realistically assessing the ability of transportation providers in the metropolitan area to fund particular projects, and balancing the needs of new facilities or capacity expansion projects with system preservation needs.

The plan can identify recommended or needed projects, but if it cannot be demonstrated that funding is reasonably likely to be available for the projects, they cannot be included in the federally recognized plan. Examples of projects and services identified as needed but not included in the fiscally constrained plan are the Bus Rapid Transit (BRT) system and some of the other transit service improvements, and construction of the North Mendota Parkway between CTH M and US 12. While the BRT system is not included in the fiscally constrained plan, planning is underway to identify and design the first segment. The City of Madison (Metro Transit) will then apply for federal Small Starts funding for the project. The City of Madison has included funding for the project in its multi-year capital budget. It is anticipated that the project will be amended into the plan once an initial route and station locations have been identified.

The financial capacity analysis takes into account recent trends in sources and uses of funds, and estimates the ability of existing funding sources to meet the maintenance, preservation, and capacity expansion needs of the transportation system. Estimated project costs and funding must be in year-of-expenditure dollars, reflecting an assumed inflationary factor. An inflationary factor of 2.0% for both project costs and program funding has been assumed in accordance with WisDOT and FHWA guidance.

The current federal surface transportation legislation, the Fixing America's Surface Transportation (FAST) Act, passed in December 2015, provides the federal transportation funding program and planning framework for the next few years. The legislation provides for about a 2% annual increase in funding through 2020. While there have been some relatively minor



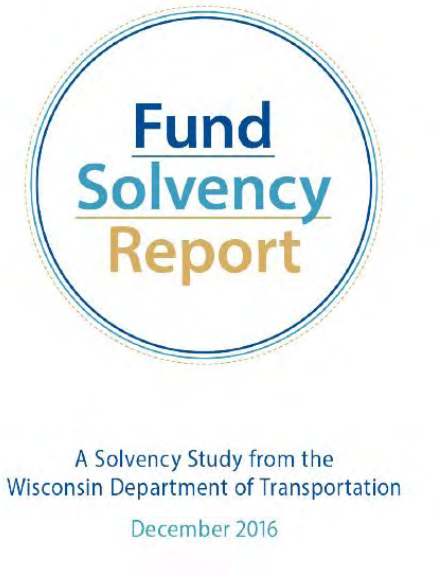
changes in programs, the current basic framework has been in place since 1991 when the landmark ISTEA legislation was passed. Therefore, it is safe to assume that this basic framework and recent funding levels will continue. While some short-term funding methods were employed to provide the necessary funding for the FAST Act, it is expected that a long-term solution will be developed to maintain funding levels. Any changes in programs or funding levels provided in the next reauthorization legislation will be incorporated into an updated financial analysis as part of the next major plan update in five years.

The financial capacity analysis assumes that state funding will also increase around 2% annually. Unlike the case with federal funding, this has not been the recent trend. According to a recent WisDOT report (see below), since 2006 the state motor vehicle fuel tax rate has remained the same and annual revenue from the tax has grown only 7.2% - a compound annual growth rate of 0.6%. Adjusted for inflation, gas tax revenue has actually declined during this period. As a result, WisDOT has in recent years relied on transfers from the General Fund and Petroleum Inspection Fund, along with increased bonding. This plan assumes that in the long term, the state transportation fund situation will be addressed and that inflationary increases to recent spending levels in the Madison metro area will be provided.

State Transportation Fund Solvency Report – A Solvency Study from the Wisconsin Department of Transportation (Dec. 2016)

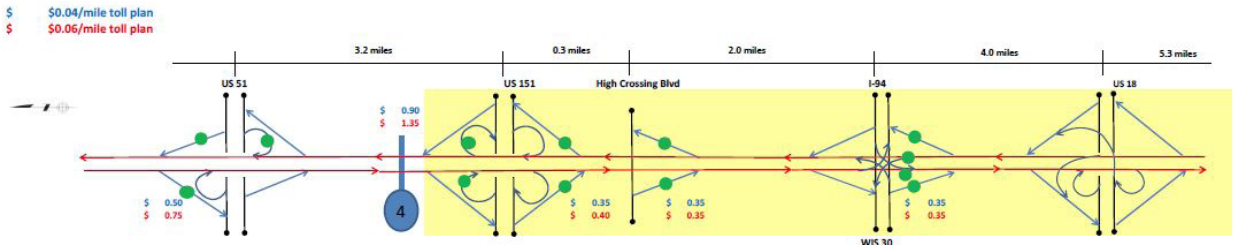
The 2015-17 biennial budget required WisDOT to conduct a study of the solvency of the state transportation fund. The study relied in part on a 2013 study by the Wisconsin Commission on Transportation Finance & Policy that examined and made recommendations regarding new revenue sources. The 2016 study analysis included five main components:

- Results from a related study focused on recent efficiency improvements at WisDOT;
- Description of current revenue sources for transportation;
- Description of current transportation expenditures by program area;
- Analysis of scenarios for future expenditures compared to projected revenues; and
- Potential options for new revenue, including a detailed feasibility study of tolling the Interstate highways in the state.



Tolling was not fully evaluated in the 2013 study, so the latest study included an examination of the feasibility of tolling on the Interstate highways in the state. This feasibility study evaluated current and best practices from tolling in other states, legal and policy issues that would need to be addressed, and revenue and traffic forecasting for tolling (including an estimate of infrastructure and operating costs and potential traffic diversion from tolled routes).

The fund solvency study projected revenues over the next 10-year period and then examined three different expenditure scenarios, and their impacts on the resulting condition of the transportation system. In terms of revenues, motor vehicle fuel



Tolling example for the I-39/90/94 corridor through the metropolitan planning area. Source: WisDOT Solvency Report, Appendix B.

taxes are expected to decrease due to greater vehicle fuel efficiency while vehicle registration fees are expected to grow a small amount. The three expenditure scenarios for 2018-2027 were: (1) spending less than the current 2015-17 budget; (2) spending at same level as current budget; and (3) a modest increase in spending above the current budget levels. A funding shortfall was projected for all scenarios – from $852 million over the decade in one to $7.94 billion in three.





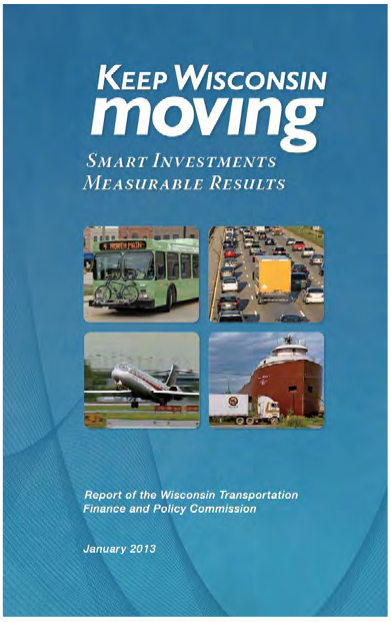
Under scenario one, the number of state highway system miles rated in poor or worse condition would increase 109% from 21% to 44% by Fiscal Year (FY) 2027. The second phase of the Verona Road (US 18/151) project, which involves expansion of Verona Road south to CTH PD and new interchanges at Williamsburg Way and CTH PD, would be delayed a year to 2019-2021 and the Interstate 39/90 (Madison Beltline to Ill. State Line) expansion project delayed three years with the Beltline/Interstate interchange project funded in FYs 2025-27 following completion of the Interstate expansion project. No new Majors program projects, such as the Beltline and Stoughton Road/US 51 currently being studied, could be enumerated (approved for funding) by the state Transportation Projects Commission until FY 2026-30. Other estimated impacts include a cumulative loss in purchasing power (given inflationary cost increases) of $798 million in local General Transportation Aids (GTA) – the largest source of state funding for local roadways – and a cumulative funding gap in Metro Transit operating assistance of $25 million.

Under scenario two, the number of state highway system miles rated in poor or worse condition would increase 93% while the number rated at fair or better would decrease by 25%. The Verona Road and Interstate expansion projects would not be delayed. New Majors program projects could be approved in 2020 (the list includes Stoughton Road/US 51 and US 51, McFarland to Stoughton) and 2026 (Beltline). GTA and Metro Transit impacts would be the same as in scenario one.

Under scenario three, the number of state highway system miles rated in poor or worse condition would increase 72% while the number rated at fair or better would decrease by 19%. The Verona Road project could be constructed a year ahead of schedule (2017-2019). The Interstate/Beltline interchange project could be funded in FY 2021-2023 at the completion of the Interstate expansion project. Enumeration of the Stoughton Road/US 51 and US 51, McFarland to Stoughton projects would still occur in 2020, but the Beltline project could be enumerated in FY 2022. GTA impacts are assumed to remain the same, while the scenario assumes approval of enabling legislation for local transit authorities, the increased revenue from which could offset the loss of state transit operating funding and address unmet capital needs. For Metro Transit, these capital needs include a planned new satellite bus garage/maintenance facility that is needed to accommodate a larger bus fleet required to expand weekday peak period service, add larger, articulated buses, and ease severe over-crowding at the current facility.

The fund solvency study considered potential additional revenue sources and estimated their potential revenue. These include increases to current fuel-based taxes and vehicle registration and license fees and three completely revenue sources: registration fee based on number of miles a vehicle is driven; new highway use fee of 2.5% on the price of new vehicle registered in state for the first time; and tolling on the Interstate system. Federal restrictions would likely limit the use of tolling revenue to investments in the facility or the broader interstate highway from which it was collected.

The study did not make any recommendations about transportation revenue and expenditure options, including tolling. The report simply provided the scenarios and potential revenue options for consideration. In 2013, the Wisconsin Commission on Transportation Finance and Policy, which was created in the 2011-2013 biennial state budget and charged with examining issues related to the future of transportation finance in Wisconsin, recommended strategies for additional funding.



The Commission issued a report, Keep Wisconsin Moving – Smart Investments, Measurable Results, which recommended additional annual funding of around $480 million over the following ten years for all modes of transportation. That level of investment was determined to be needed to maintain existing road and bridge conditions, make safety improvements, provide limited major highway modernization, and provide some other multi-modal facility and service improvements. In order to provide the additional revenue, the Commission recommended the following:

- Raise the state gas tax by 5 cents, to 23 cents per gallon;
- Adopt a new mileage-based registration fee for cars and light trucks that would amount to one cent for each mile traveled;
- Increase the annual registration fees for commercial vehicles by 73 percent;
- Increase the fee for an 8-year drivers license by $20; and
- Eliminate the sales tax exemption on the trade-in value of a vehicle.

The Commission also recommended the following:

- Enactment of legislation to allow for regional or local transportation or transit authorities supported by county or local sales taxes;
- Increase bonding while keeping debt service payments at a manageable level;
- Indexing the state fuel tax and vehicle registration fees to the inflation rate as had been the case for many years;
- Support federal legislation to allow states more flexibility to enact tolls on the Interstate system and other highways designated as part of the National Highway System; and
- Support a state constitutional amendment to protect the state transportation fund - passed in a November 2014 ballot measure.

FUNDING TRENDS IN THE MADISON METRO AREA

County and Municipal Streets/Roadways

Municipal streets are mostly financed by local funding sources. These include general revenues and bonds and, in the case of municipalities, also special assessments, impact fees, and tax increment financing. Counties cost share with municipalities on some projects. WisDOT distributes state funding to counties and municipalities through the state's General Transportation Aids and Connecting Highway Aids programs, and through other local programs such as the Local Road Improvement Program.

Figure 6-1, Historical County and Local Street/Roadway Expenses, shows the expenditures for operations and maintenance, construction, and other street related facilities (e.g., lighting, sidewalks, storm sewers) by municipalities in the Madison

Figure 6-1

Historical County and Municipal Street/Roadway Expenses ($000's)

within the Madison Metropolitan Planning Area

	2010				2011				2012				2013				2014			
County/ Municipality	**O & M [1]**	**Const. [2]**	**Other [3]**	**Total**	**O & M [1]**	**Const. [2]**	**Other [3]**	**Total**	**O & M [1]**	**Const. [2]**	**Other [3]**	**Total**	**O & M [1]**	**Const. [2]**	**Other [3]**	**Total**	**O & M [1]**	**Const. [2]**	**Other [3]**	**Total**
Dane County [4]	6,955.8	3,053.5	363.4	10,372.7	7,762.8	1,684.0	1,025.6	10,472.4	8,096.3	7,610.1	717.3	16,423.7	7,800.9	6,794.7	452.4	15,048.0	7,824.2	4,906.5	381.8	13,112.5
C. Fitchburg	1,541.6	2,803.9	159.6	4,505.1	1,552.8	3,416.9	140.2	5,109.9	1,543.3	16,629.9	134.6	18,307.8	3,416.2	2,020.5	133.3	5,570.0	1,870.3	8,287.8	182.6	10,340.7
C. Madison	24,201.6	17,177.5	4,687.9	46,067.0	18,597.8	25,050.9	7,272.9	50,921.6	17,767.1	26,463.0	5,793.1	50,023.2	19,519.6	17,360.1	6,371.6	43,251.3	20,900.8	18,097.0	10,235.7	49,233.4
C. Middleton	2,015.5	1,899.5	271.6	4,186.6	2,118.7	1,129.1	322.7	3,570.5	1,862.0	1,064.2	463.5	3,389.7	2,406.0	2,682.9	370.8	5,459.7	2,186.0	1,136.4	8,602.3	11,924.7
C. Monona	710.6	2,751.6	71.2	3,533.4	763.4	3,599.2	95.3	4,457.9	749.0	3,100.2	116.8	3,966.0	736.3	3,135.2	105.1	3,976.7	890.7	615.4	161.9	1,668.0
C. Stoughton	1,336.4	317.6	1,322.7	2,976.7	1,365.0	914.4	928.4	3,207.8	1,246.0	577.9	762.6	2,586.5	1,132.8	486.8	202.7	1,822.4	1,202.8	2193.9	287.9	3,684.6
C. Sun Prairie	3,083.3	2,199.0	651.8	5,934.1	2,783.0	2,400.3	662.5	5,845.8	2,688.1	1,518.7	445.4	4,652.2	3,163.5	2,221.7	390.9	5,776.1	2,985.0	3,118.6	973.1	7,076.6
C. Verona	914.0	1,180.1	183.5	2,277.6	1,284.3	1,057.0	208.0	2,549.3	1,532.9	1,138.3	721.5	3,392.7	1,111.8	2,362.9	203.8	3,678.4	1,047.8	1,608.6	222.2	2,878.6
Cities Total	**33,803.0**	**28,329.2**	**7,348.3**	**69,480.5**	**28,465.0**	**37,567.8**	**9,630.0**	**75,662.8**	**27,388.4**	**50,492.2**	**8,437.5**	**86,318.1**	**31,486.3**	**30,270.1**	**7,778.2**	**69,534.5**	**31,083.3**	**35,057.7**	**20,665.7**	**86,806.7**
V. Cottage Grove	572.1	406.4	120.3	1,098.8	447.2	337.8	94.6	879.6	522.7	1,173.7	93.1	1,789.5	718.4	359.2	148.2	1,225.8	1,291.1	2.3	93.6	1,386.9
V. Cross Plains	392.0	220.7	69.7	682.4	344.2	314.5	71.4	730.1	341.0	175.6	73.4	590.0	429.8	891.3	76.6	1,397.7	419.8	1,631.8	76.1	2,127.6
V. DeForest	424.6	857.7	372.2	1,654.5	530.7	888.2	155.4	1,574.3	413.8	2,344.5	259.6	3,017.9	457.9	2,226.4	216.6	2,900.9	466.8	1,235.4	371.2	2,073.4
V. Maple Bluff	105.7	2,956.9	427.9	3,490.5	133.3	62.4	62.4	258.1	248.7	71.7	52.2	372.6	237.4	216.2	34.9	488.6	223.4	3,840.5	51.3	4,115.2
V. McFarland	1,113.8	21.7	95.5	1,231.0	1,050.1	-	119.4	1,169.5	984.8	-	104.9	1,089.7	912.4	239.3	109.7	1,261.5	967.2	212.3	97.5	1,277.0
V. Oregon	812.8	520.7	384.0	1,717.5	906.2	93.5	206.9	1,206.6	458.5	125.5	222.7	806.7	707.1	199.6	171.0	1,077.7	706.1	449.4	158.7	1,314.2
V. Shorewood Hills	275.5	1,011.2	25.2	1,311.9	201.2	1,233.7	23.5	1,458.4	273.0	1,061.2	26.9	1,361.1	218.8	1,163.3	30.9	1,413.0	334.5	619.9	176.1	1,130.5
V. Waunakee	1,764.7	2,420.1	291.8	4,476.6	1,275.6	1,659.8	472.0	3,407.4	977.5	1,471.0	366.5	2,815.0	967.0	2,230.9	317.6	3,515.5	1,253.5	1,824.8	943.5	4,021.8
V. Windsor 5	257.2	131.4	27.6	416.3	287.5	84.8	28.5	400.8	265.6	203.7	27.8	497.0	285.3	212.7	28.6	526.6	302.2	211.2	32.4	545.8
Villages Total	**5,718.4**	**8,546.8**	**1,814.2**	**16,079.5**	**5,176.0**	**4,674.7**	**1,234.1**	**11,084.8**	**4,485.6**	**6,626.9**	**1,227.1**	**12,339.5**	**4,934.0**	**7,739.1**	**1,134.2**	**13,807.2**	**5,964.5**	**10,027.6**	**2,000.5**	**17,992.5**
T. Berry [6]	38.1	65.6	0.0	103.8	51.4	89.1	0.0	140.6	65.6	35.4	0.0	101.0	56.4	20.8	0.1	77.3	50.2	30.6	0.1	80.8
T. Blooming Grove	232.4	93.7	16.2	342.3	111.2	152.7	19.9	283.8	190.4	204.1	17.3	411.8	150.6	140.6	24.8	316.0	164.8	203.9	24.5	393.3
T. Bristol [7]	259.5	29.3	8.3	297.1	387.1	2.1	9.1	398.3	280.1	-	9.9	290.1	420.9	-	8.4	429.3	244.6	-	10.0	254.6
T. Burke	303.1	24.9	13.7	341.7	229.2	366.9	8.5	604.6	256.1	467.4	9.0	732.5	257.3	202.4	9.7	469.4	251.3	483.1	10.2	744.6
T. Cottage Grove [8]	430.5	129.7	-	560.2	377.7	134.6	-	512.3	371.5	218.7	-	590.2	388.1	255.0	1.4	644.6	353.9	341.4	1.3	696.7
T. Cross Plains [9]	61.7	54.1	0.4	116.2	60.3	1.3	0.5	62.1	54.0	1.3	0.5	55.9	71.2	-	0.5	71.7	83.8	-	0.5	84.4
T. Dunkirk [10]	261.9	-	4.2	266.2	336.6	-	7.2	343.7	195.6	82.2	18.0	295.8	229.1	101.2	4.7	335.0	287.1	43.5	5.0	335.6
T. Dunn	411.6	151.8	11.5	574.9	405.8	117.7	11.8	535.3	447.6	177.6	12.0	637.2	584.4	168.7	12.6	765.7	481.5	299.4	12.6	793.4
T. Madison	333.6	852.9	30.1	1,216.6	347.3	874.7	35.6	1,257.6	369.2	132.8	33.0	535.0	348.1	0.8	36.2	385.1	689.5	85.3	34.4	809.3
T. Middleton	404.4	809.9	235.0	1,449.3	447.3	1,573.2	70.0	2,090.5	446.9	429.6	199.3	1,075.8	539.9	381.1	63.5	984.5	1,147.2	514.0	126.7	1,787.9
T. Oregon [11]	110.3	107.3	-	217.5	184.7	100.5	-	285.2	95.9	113.2	-	209.1	144.2	141.6	-	285.8	166.2	94.6	-	260.8
T. Pleasant Springs [12]	258.8	-	0.5	259.3	359.5	-	0.5	360.0	302.5	-	0.5	303.1	332.6	-	0.6	333.2	400.3	-	0.6	400.9
T. Rutland [13]	68.9	28.1	1.5	98.4	76.8	78.6	0.9	156.3	68.2	86.9	0.8	155.9	96.8	134.6	0.9	232.2	78.9	81.8	1.5	162.1
T. Springfield [14]	201.4	2.3	1.0	204.6	237.4	2.3	1.1	240.7	378.6	1.7	1.2	381.5	245.2	1.2	1.3	247.7	301.3	1.5	1.3	304.0
T. Sun Prairie [15]	181.8	-	-	181.8	652.7	-	-	652.7	298.0	-	-	298.0	227.7	-	-	227.7	217.5	-	-	217.5
T. Verona [16]	284.1	116.8	2.3	403.3	217.9	254.4	2.4	474.7	231.8	181.2	2.4	415.5	414.2	51.7	2.2	468.1	244.6	428.6	2.5	675.7
T. Vienna [17]	244.9	46.6	1.7	293.1	206.2	106.7	1.8	314.6	157.0	131.8	1.5	290.3	213.8	93.3	1.4	308.5	231.8	240.7	1.6	474.2
T. Westport	1,040.9	-	3.2	1,044.1	940.7	-	3.4	944.1	461.2	-	3.4	464.6	561.8	-	3.9	565.7	1,299.9	-	4.1	1,303.9
Towns Total	5,127.8	2,512.9	329.8	7,970.5	5,629.7	3,854.8	172.7	9,657.2	4,670.4	2,264.0	308.9	7,243.3	5,282.4	1,692.9	0,172.1	7,147.5	6,694.5	2,848.4	0,236.8	9,779.7
MPO PL Area Total	**51,605.1**	**42,442.4**	**9,855.7**	**103,903.2**	**47,033.5**	**47,781.3**	**12,062.3**	**106,877.2**	**44,640.7**	**66,993.3**	**10,690.8**	**122,324.7**	**49,503.5**	**46,496.8**	**9,536.9**	**105,537.2**	**51,566.4**	**52,840.2**	**23,284.7**	**127,691.4**

[1] Roadway operations and maintenance costs, including costs for engineering, highway equipment, and buildings. For county, includes depreciation for equipment and buildings.

[2] Includes operating expenditures and capital costs for constructing roadways.

[3] Includes operating expenditures and capital costs for road related facilities costs, including limited purpose roads, street lighting, sidewalks, storm sewers, and parking facilities.

[4] Estimated at 89.19%.
[5] Estimated at 76.49%.
[6] Estimated at 24.93%.
[7] Estimated at 72.35%.
[8] Estimated at 81.88%.
[9] Estimated at 30.86%.
[10] Estimated at 65.09%.
[11] Estimated at 45.16%.
[12] Estimated at 65.12%.
[13] Estimated at 36.22%.
[14] Estimated at 50.48%.
[15] Estimated at 66.90%.
[16] Estimated at 80.75%.
[17] Estimated at 67.68%.

Note: Costs rounded to nearest $1,000. "-" indicates zero or no data available, while 0.0 indicates less than $500.

Source: Wisconsin Dept. of Revenue, County and Municipal Revenues and Expenditures Reports.

Metropolitan Planning Area from 2010 to 2014, the last year for which data was available. The expenses include those from local revenues as well as state and federal programs. The source of the information are the *County and Municipal Revenues and Expenditures by Wisconsin Cities, Villages & Towns* reports published by the Wisconsin Department of Revenue. Total annual costs for Dane County and all municipalities within the Madison Metropolitan Area during this 5-year period ranged from $103.9 million in 2010 to $127.7 million in 2014 with an annual average of $113.3 million.



Federal and State Funding for Streets/Roadways

Federal and state funding accounted for 24% and 56% of revenues, respectively, in the WisDOT 2015-17 biennial budget with bond funds (13%) and other funds (7%) accounting for the remainder.



Federal funding is derived from the federal motor fuel tax and then allocated to the states and large urban areas. Federal program funding sources under the current surface transportation legislation, the FAST Act, that are used for roadway improvements include the following:

- National Highway Performance Program (NHPP);
- Surface Transportation Program Block Grant (STBG) Program (formerly Surface Transportation Program), which includes several categories of funding (Urban, Rural/Small Urban, State Flexibility, and Bridge Replacement and Rehabilitation); and
- Highway Safety Improvement Program (HSIP) (includes three categories).



The NHPP and STBG – State Flexibility programs have been used exclusively for state highway projects, while the HSIP and STBG – Bridge programs are available for funding both state and local projects. The STBG – Urban and Rural/Small Urban programs are for county and local roadway projects. For the Madison Metropolitan Area, the STBG Urban Program is the most significant of these federal programs. Most of the funding has been used for county and local road projects, but the program has also been used for other capital projects such Metro Transit bus purchases and a programmed ITS project. MATPB receives an allocation of STBG Urban Program funding and selects county and local projects for funding based on approved policies and project evaluation criteria. MATPB's allocation for 2016-2020 is an average of $6.86 million per year. Based on the FAST Act, the current federal transportation bill, funding for the upcoming 2018-2022 program cycle is expected to increase to an annual average of $7.07 million. This funding level is assumed to continue with inflationary adjustments as with other programs.



State transportation funding is derived primarily from the state motor fuel tax, driver license fees, and vehicle registration fees. Funding for state

highways is distributed through several programs, including the following:

- State Highway Rehabilitation (SHR) program, which funds maintenance work on existing state highways along with safety and minor capacity improvements;
- Highway System Management and Operations (HSMO) program, which funds activities to ensure the proper functioning and safety of the state highway system, including traffic operations and management of the State Traffic Operations Center; and
- Majors program, which funds the most complex and costly projects, often involving capacity expansion, to address the most serious deficiencies on the most important state highways.

Figure 6-2

Annual Roadway Revenue Estimates ($000's)

for the Madison Metropolitan Planning Area

Roadway Construction	Funding Program	Avg. Annual Funding ($000s)
State Highways		
Federal/State Funding	Combined Backbone and non-Backbone and Majors	$ 69,876
Local Roadways		
Federal/State Funding	STBG, Local Roads Improvement Program (LRIP), Federal Safety Programs, Local Bridges, 70% General Transportation Aids , 70% Connecting Highway Aids	$ 24,035
Local Funding	Total County/Local Revenue (from State Department of Revenue) less Federal/State Funding Estimate	$ 45,001
Subtotal of Local Roadways		***$69,035***
Subtotal		**$ 138,912**
Roadway Maintenance and Operations	**Funding Program**	**Avg. Annual Funding ($000s)**
State Highways		
Federal/State Funding	State Highway Maintenance and Operations, State Highway Rehabilitation (SHR) Bridges, SHR Large Bridges	$ 7,964
Local Roadways		
Federal/State Funding	30% General Transportation Aids, 30% Connecting Highway Aids	$ 6,012
Local Funding	Total County/Local Revenues (from State Department of Revenue) less Federal/State Funding Estimate	$ 52,390
Subtotal of Local Roadways		***$58,402***
Subtotal		**$ 66,365**
Total		**$205,277**

Figure 6-2 shows the annual federal and state funding program revenue estimates (in current dollars) based on recent funding levels over the past 5-6 years. The federal and state funding estimates were provided by WisDOT. Estimated annual funding for Major state highway projects and state highway and bridge preservation and TSM/safety construction projects is $69.9 million, while estimated funding for state highway maintenance and operations is $7.9 million, for a total of $77.8 million. Estimated federal and state funding for local roadway and bridge preservation and TSM/safety construction projects is $24.0 million, while estimated funding for maintenance and operations is $6.0 million, for a total of $30.0 million. This amounts to about 20% of total funding for local roadways. Local funding for local roadways was estimated by subtracting federal/state funding from total revenues.

Public Transit Funding

The major transit operator in the Madison area is Metro Transit, which is owned by the City of Madison and operates within the oversight of the Mayor, Common Council, and the City's Transit & Parking Commission. Metro contracts with other municipalities and public institutions (including UW-Madison, Madison College, and the Madison Metropolitan School District) to provide service for their constituents.

Metro 's capital and operating costs are funded through a combination of federal funding, state operating assistance, passenger fares, and local funds primarily derived from the property tax. Federal funding may be used for capital project expenses, preventive maintenance costs, and a portion may be used for complementary paratransit service for persons unable to use the regular fixed-routes.

The majority of Metro's federal funding comes from the Section 5307 Urbanized Area Formula Program (UAFP), which is apportioned based on revenue vehicle-miles, population, and population density. Metro's FY 2016 apportionment of Section 5307 UAFP funding was $7.7 million. Metro also receives Federal Section 5337 State of Good Repair and Section 5339 Bus and Bus Facilities formula programs. Funding for the Section 5337 program is based on the miles of bus lanes and other dedicated transit facilities, such as the State Street pedestrian and transit mall, while funding for the Section 5339 program is based on urbanized area population and bus passenger-miles traveled divided by operating costs. Metro's FY 2016 apportionment for these two programs combined was $1.6 million. Two discretionary components to the Section 5339 program were added under the recently approved FAST Act: a bus and bus facilities program based on asset age and condition and a low or no emissions bus deployment program.

Funding, in particular operating funds, has been and continues to be a major challenge for Metro. State operating assistance in 2015 was actually slightly lower than in 2010, dropping the percentage of Metro's operating expenses covered by the state from 35.6% to 31.6%. At one time in the mid-1990s state operating assistance covered 45% of Metro's operating budget. Figure 6-3 shows the distribution of Metro's operating revenue from 2011-2015. The percent covered by local funding has increased from 28.9% to 32.4% and the percent covered by fares has increased from 23.7% to 24.1%.

Because Metro must now use the majority of its federal funding for eligible operating expenses, this has put a squeeze on its capital budget, making it difficult to keep up with its bus fleet replacement schedule let alone address other capital needs.

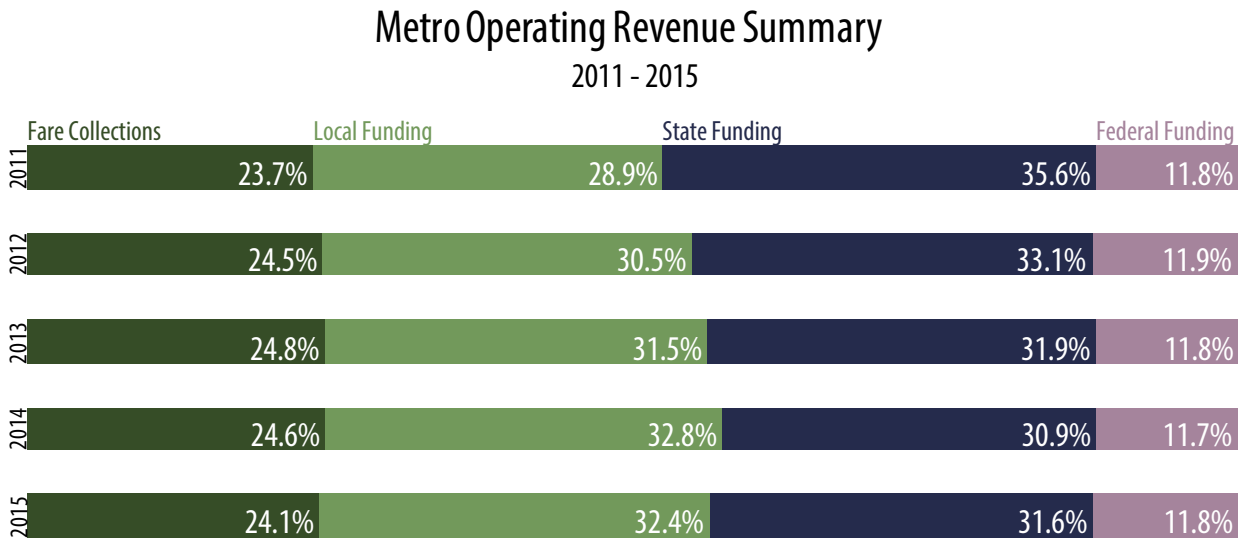


Figure 6-3: Metro Operation Revenue Summary

Given flat state funding and tight local budgets, in part due to the state expenditure restraint program, and the many other competing demands for property taxes, it will become increasingly difficult for Metro to cover inflationary operating cost increases in the future let alone meet the service improvement and expansion needs of the growing metro area and address its capital needs. A regional transit governance structure with a dedicated local source of transit funding will be needed in order to make major regional service improvements such as building out the full BRT system, initiating express commuter service to outlying communities, and increasing service frequency in the core area.



The state legislature adopted legislation in 2009 authorizing the creation of the Dane County Regional Transit Authority (DCRTA) with the authority to implement a local sales tax of up to ½ percent. The DCRTA was formed in 2010 and, with the help of City of Madison, Metro, and MPO staff, developed a draft short-term plan for improved transit service to support a referendum on a ¼ percent sales tax. However, Assembly Bill 40 (Act 32) was passed in 2011, eliminating the RTA authorizing legislation and dissolving the DCRTA.

Figure 6-4 shows Metro Transit's average capital and operating revenues from 2011-2015 based on the agency's National Transit Database (NTD) reports. Capital expenses fluctuated considerably, ranging from a low of $1.1 million in 2013 to $12.1 million in 2014, averaging $6 million annually. Operating expenses increased each year from $49.5 million in 2011 to $55.0 million in 2015, with a 5-year average of $52.4 million. The five-year average for capital and operating expenses combined was $58.4 million.

Figure 6-4

Annual Transit Revenue Estimates ($000's)

for the Madison Metropolitan Planning Area

Metro Transit	Funding Program	Avg. Funding ($000s)
Capital		
Federal Funding	Urbanized Area Formula Program (5307), State of Good Repair Formula Program (5337),Bus & Bus Facilities Formula Program (5339)	$ 4,830
Local Funding	City of Madison Property Taxes and Cooperative Agreements with Neighboring Municipalities	$ 1,208
Subtotal		**$6038**
Operating		
Federal Funding	Urbanized Area Formula Program (5307),Special Needs/ADA (5310)	$ 6,189
State Funding	State Operating Assistance	$ 17,063
Local Funding	City of Madison Property Taxes and Cooperative Agreements with Neighboring Municipalities, Advertising and Other Revenues	$ 15,674
Passenger and other General Revenue	Collections on Buses, Transit Passes, Advertising, etc.	$ 13,467
Subtotal		**$ 52,393**
Total		**$58,431**

Bicycle and Pedestrian Funding



Local sources provide most of the funding used for off-street bicycle and pedestrian facilities. This includes Dane County's relatively new PARC & Ride Bicycle Grant Program, which has provided over $750,000 in the past two years for grants to local communities for bicycle trail projects. Federal funding for off-street bicycle and pedestrian facilities is provided primarily through the Transportation Alternatives Program (TAP). MATPB receives an allocation of TAP funds, which it directs towards projects it selects. WisDOT also receives a TAP funding allocation, which it uses to fund projects throughout the state. Madison area projects are also eligible for this statewide pool of funds, and two projects were awarded funding in the 2015-2018 program cycle. Factoring in that additional funding along with MATPB's funding allocation, the average annual TAP funding has been $746,000. Off-street bicycle facilities, such as grade-separated crossings and side paths, have also been included in recent years as part of street construction projects funded by MATPB through the federal STBG (formerly STP) Urban program. Excluding the TAP funding, an average annual total of $4.05 million has been programmed for off-street bicycle projects in the past three Transportation Improvement Programs, resulting in an average total of $4.8 million in available funding each year. On street bicycle and pedestrian facility costs are included as part of street projects, and have no stand alone costs. As a result, no projections were generated for on-street facilities.

Figure 6-5

Annual Transit Revenue Estimates ($000's)

for the Madison Metropolitan Planning Area

Bicycle and Pedestrian Facilities	Funding Program	Avg. Annual Funding ($000s)
Off-Street Facilities		
Federal/State Funding	STBG - Transportation Alternatives Program (TAP) Set Aside	$ 746
Local and Other Funding	County PARC & Ride Bicycle Grant Program, Local municipal funding, Other	$ 4,054
Subtotal		$4,800

PROJECTED REVENUES THROUGH 2050

Figure 6-6 shows the projected total revenues for transportation projects for the next 34-year period from 2017 to 2050 assuming that recent funding levels remain relatively constant other than inflationary increases. It is estimated that a total of $13.3 billion could potentially be available to finance projects over the 34-year planning period. The federal and state roadway revenue estimates are based on a 6-year rolling average[1] of expended funds between 2011 and 2016 obtained from WisDOT. Local roadway revenue estimates on based on the 5-year average of expended funds from 2010-2014 obtained from State Department of Revenue reports after subtracting out federal and state funding received. Metro Transit capital revenues (federal and 20% local match) are based on the 5-year average from 2011-2015 in the agency's NTD reports. Metro operating funding (federal, state, and local) is based on the average annual percent increase in operating funding in constant dollars during the same period (0.7%) based on the NTD reports. Federal funding for off-street bicycle and pedestrian facilities is based on the current average annual allocation to MATPB for the FY 2016-2020 program plus additional funding received for FYs 2016-2018, while local and other funding is based on the average funding programmed in the past three TIPs (2015-'19, '16-'20, and '17-'21). Averages were extrapolated to 2050 using an inflation rate of 2 percent. In the case of transit operating revenues, the inflation rate was applied to the assumed average annual increase in constant dollars. Funds were then divided into three time periods (2017-2020, 2021-2035, and 2036-2050) reflecting programmed projects over the next four-year period to 2020 and then two subsequent 15-year increments.

[1] 5-year rolling average period for the General Transportation Aids and Connecting Highway Aids programs and Local Bridge program. Majors program funding is based on average annual amount enumerated for projects from FY 2014-2020.

Figure 6-6

Estimated Transportation Revenue, 2017 - 2050 ($000's)

for the Madison Metropolitan Planning Area

Source	2017-2020	2021-2035	2036-2050	Total
Roadway Construction				
State Highways				
Federal/State Funding	$279,505	$1,269,419	$1,708,470	$3,257,394
Local Roadways				
Federal/State Funding	$96,139	$436,633	$587,650	$1,120,423
Local Funding	$180,002	$817,509	$1,100,259	$2,097,770
Subtotal of Local Roadways	***$276,142***	***$1,254,142***	***$1,687,910***	***$3,218,193***
Subtotal of Roadway Construction	**$555,647**	**$2,523,560**	**$3,396,380**	**$6,475,587**
Roadway Maintenance and Operations				
State Highways				
Federal/State Funding	$31,855	$144,673	$194,710	$371,238
Local Roadways				
Federal/State Funding	$24,048	$109,216	$146,990	$280,254
Local Funding	$209,560	$951,750	$1,280,930	$2,442,239
Subtotal of Local Roadways	***$233,607***	***$1,060,966***	***$1,427,920***	***$2,722,493***
Subtotal of Maintenance and Operations	**$265,462**	**$1,205,638**	**$1,622,630**	**$3,093,731**
Metro Transit				
Capital				
Federal Funding	$20,583	$93,481	$125,813	$239,877
Local Funding	$5,146	$23,370	$31,453	$59,969
Subtotal of Capital	***$25,729***	***$116,851***	***$157,266***	***$299,846***
Operating				
Federal Funding	$28,548	$138,929	$207,604	$375,081
State Funding	$78,730	$383,142	$572,538	$1,034,410
Local Funding	$75,587	$367,849	$549,686	$993,122
Farebox	$58,860	$286,445	$428,041	$773,346
Subtotal of Operating	***$241,725***	***$1,176,365***	***$1,757,869***	***$3,175,959***
Subtotal of Metro Transit	**$293,182**	**$1,410,067**	**$2,072,402**	**$3,475,805**
Bicycle and Pedestrian Facilities				
On-Street Facilities	----included as part of street project funding ----			
Off-Street Facilities				
Federal/State Funding	$3,136	$14,244	$19,170	$36,550
Local Funding	$16,709	$75,887	$102,133	$194,729
Subtotal of Off-Street Facilities	***$19,845***	***$90,130***	***$121,303***	***$231,279***
Subtotal	**$19,845**	**$90,130**	**$121,303**	**$231,279**
Total Projected Revenue	**$1,134,136**	**$5,229,396**	**$7,212,716**	**$13,276,402**

PROJECTED EXPENSES THROUGH 2050

Figure 6-7 shows projected transportation expenses. Expenses are estimated at $12.8 billion for the planning period. Separate methodologies, detailed below, were developed to determine future expenses for roadway construction, maintenance, and operations; bicycle and pedestrian facilities; and Metro Transit capital and operating costs.

Figure 6-7

Estimated Transportation Expenses, 2017 - 2050 ($000's)

for the Madison Metropolitan Planning Area

Source	2017-2020	2021-2035	2036-2050	Total
Roadway Construction				
State Highways	$279,505	$1,269,419	$1,708,470	$3,257,394
Local Roadways	$263,269	$1,228,992	$1,724,617	$3,216,878
Subtotal	$542,774	$2,498,411	$3,433,087	$6,474,272
Roadway Maintenance and Operations				
State Highways	$31,855	$144,673	$194,710	$371,238
Local Roadways	$183,788	$857,961	$1,203,957	$2,245,706
Subtotal	$215,643	$1,002,633	$1,398,667	$2,616,943
Bicycle and Pedestrian Facilities				
On-Street Facilities	----included as part of street project funding ----			
Off-Street Facilities	$22,783	$80,003	$113,764	$216,550
Subtotal	$22,783	$80,003	$113,764	$216,550
Metro Transit				
Capital Expenses	$25,729	$116,851	$157,266	$299,846
Operating Expenses	$241,725	$1,176,365	$1,757,869	$3,175,959
Subtotal	$267,453	$1,293,216	$1,915,136	$3,475,805
Total Projected Expenses	**$833,010**	**$3,871,630**	**$5,461,987**	**$12,783,571**

Roadway Construction, Maintenance, and Operations

To begin the process of projecting expenses for construction, maintenance, and operations of the roadway network in the region, the revenue analysis was coupled with a pavement condition analysis to compare funding levels over the past five years to pavement conditions for all roadways by jurisdiction (state, local) and functional classification (arterial, collector, local). Overall, Interstate, US, and state trunk highway conditions in the Metropolitan Planning Area have been gradually improving in recent years as measured by Pavement Condition Index (PCI), which reflects the structural integrity of the roadway. PCI was developed by the US Army Corps of Engineers, and is based on a visual survey of the number and types of distresses in the pavement.[2] In contrast to state highway conditions in the Metro area, local roadway pavement conditions—as measured by a similar rating system as PCI called Pavement Surface Evaluation and Rating or PASER—have been steadily deteriorating during this same period. These outcomes can be tied to state funding priorities and challenges, some of which were discussed at the beginning of this section, and local funding challenges. Figure 6-8 provides a comparison of roadway conditions between 2013 and 2015. These years were not the only ones analyzed, but are the only two with complete data sets for state highways, City of Madison streets, and other local roads and streets.

Next, average roadway construction and roadway maintenance and operations costs were calculated for local streets, collectors, and local arterials within the City of Madison and other metropolitan area cities, villages, and towns by averaging the total lane miles in each municipality by the average annual costs between 2010 and 2014. Average maintenance and operations costs

[2] The Federal Highway Administration requires states to report highway conditions as measured by the International Roughness Index (IRI), which measures the smoothness of the roadway pavement. IRI data indicate the condition of state highways is in worse condition. WisDOT has indicated that Pavement Condition Index (PCI) is the more accurate and appropriate measure because IRI doesn't necessarily mean a roadway is in poor condition and needs extensive rehabilitation or maintenance work.

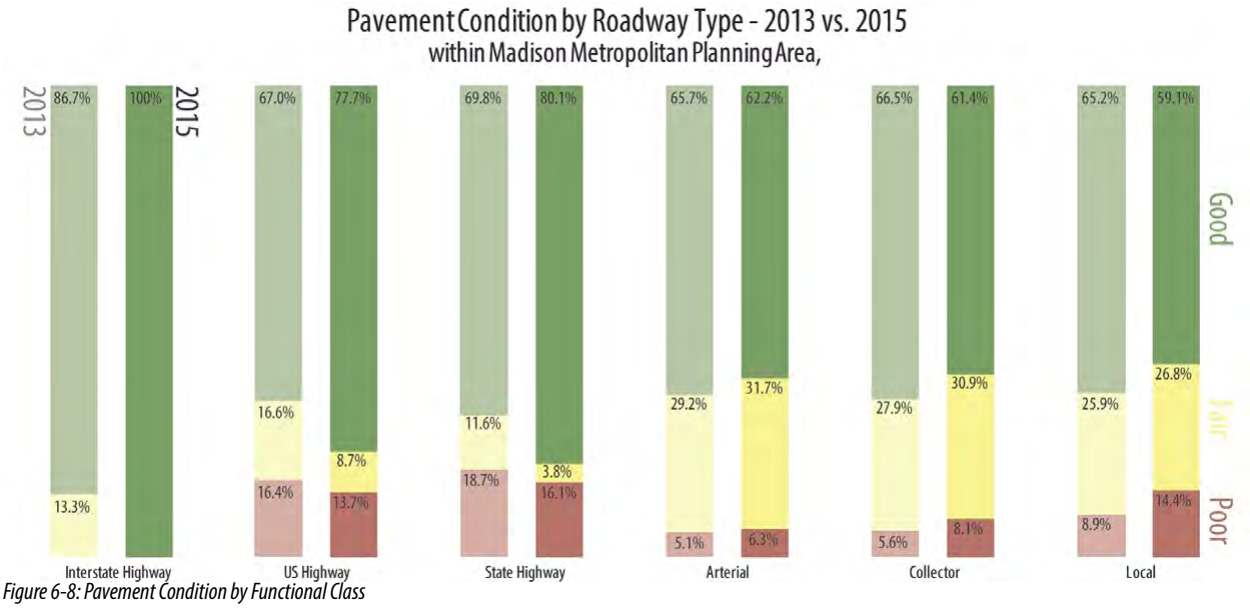


Figure 6-8: Pavement Condition by Functional Class

were highest within the City of Madison at over $10,915 per lane mile annually, compared to only $4,327 in towns. Construction costs were, surprisingly, highest in suburban cities bordering Madison, at over $18,211 per lane mile, compared to $14,968 for Madison and $13,304 for villages. These cost differences are likely due to the addition of new urban infrastructure when roads are reconstructed, such as street lights, curb and gutter, and urban furniture.

A lane mileage growth factor was calculated by comparing year-over-year growth of the local transportation network within the Metro area. The number of lane-miles of local roads has grown at a rate of 0.09%, while the growth rate for arterials was 0.9%. The growth rate, lane mileage cost, and inflation factor of 2 percent were applied to each spending category for municipal roads and extrapolated to 2050.

Using these assumptions, it is projected that $3.2 billion will be needed for local roadway construction over the 34-year planning period to 2050, while $2.2 billion will be needed for maintenance and operations. Projected local roadway revenues are $5.9 billion, resulting theoretically in a "surplus" of around $478 million. However, this additional revenue will likely be needed to fund preservation projects to avoid the continued deterioration of area roadways.



Because of the assumed increase in arterial lane miles, projected local roadway construction costs should include the cost of the major capacity expansion projects on local roadways listed in Appendix A. The cost of those projects total $247 million in inflation adjusted dollars over the planning period. If the cost of these projects isn't fully

covered, however, the "surplus" could cover any extra costs for them.



The projected "surplus" will be needed for additional roadway maintenance and non-capacity expansion construction projects in order to maintain or improve roadway network condition in the future. That is because the projected expenses will merely maintain existing trends – a steadily deteriorating local roadway system. An infusion of additional revenue will be needed to ensure that roadways receive preventive maintenance before significant deterioration, which can add 15-20 years of useful life at a substantial cost savings over reconstruction. Even with timely maintenance, streets eventually need to be reconstructed and utilities replaced.

Figure A-1 in Appendix A includes a list of programmed, planned, and other potential needed future high-cost arterial reconstruction projects based on current roadway condition and year the roadway was originally constructed (where that data was available). The total inflation adjusted cost of these projects over the planning period is $378 million. This includes some programmed and planned intersection and bridge projects. Some of the identified potential roadway reconstruction projects are in peripheral developing or planned development areas that will need to be reconstructed to urban standards, but many are in existing older developed areas.

The major source of funding for local arterial reconstruction projects is the STBG (formerly STP) Urban program for which MATPB receives an allocation of funding for each multi-year program cycle. The total amount of STBG Urban funding projected to be available over the 34-year planning period is $347 million, assuming 2% annual inflationary increases in funding. Using the current 60/40 cost share policy of MATPB, this would fund projects totaling $578 million. This would cover over 90% of the local arterial reconstruction projects (both capacity expansion and preservation) identified. Some of the projects listed will be funded locally and so even though some STBG Urban funding has been and will be used for other types of projects, this demonstrates the feasibility of funding the capacity expansion projects identified while still meeting major arterial preservation project needs in the region.

Recent trends demonstrate improving pavement conditions on the state highway system within the Madison metropolitan area. This analysis assumes that maintenance and operations will continue at current expenditure levels to the end of the planning period, with a 2% inflationary growth factor. While it would appear that the system would be maintained at a high level, it should be noted that the trend of improving state highway conditions over the past few years represents only a relatively small data sample. Based on the analysis conducted by WisDOT in 2013 and again in 2016 for the state transportation fund solvency study, a substantial increase in funding will be required just to maintain current pavement conditions. The trend in pavement condition of the state and local roadway systems will continue to be monitored. WisDOT is in the process of developmenting a State Highway Investment Plan, which will include an analysis of 20-year infrastructure investment needs.

Information produced from this planning effort will be incorporated into the next 5-year update of the RTP.

For state highway construction expenditures, programmed (or scheduled with funding attached) and other near-term (5-15 years) planned projects were identified and costs estimated using the 2% annual inflationary factor. See Figure A-1 in Appendix A. Included are WisDOT Major Highway Development program projects, specifically Interstate 39/90 expansion south of the Beltline and the Verona Road (US 18/151) expansion project. The only planned Major Highway Development program project included in the plan at this time is the Beltline/Interstate interchange. This project includes three phases, the third of which includes conversion of US 12/18 east of the interchange to a freeway with an interchange at CTH AB.

Other Major Highway Development program projects, which must be recommended for enumeration by the state Transportation Projects Commission (TPC) and enumerated by the Legislature and Governor, are not known at this time. This includes potential capacity expansion projects on the Beltline, Stoughton Road, and US 51 (McFarland to Stoughton) that are currently being studied, as well as the I-39/90/94 and WIS 19 / North Mendota Parkway corridors that are recommended for future study. The preferred roadway improvement alternatives for the Beltline and Stoughton Road corridors have not been determined. Once the studies are completed, the scope of specific improvements identified, costs estimated, and Major Highway Development program funding either secured or determined to be reasonably likely to be available, the plan will be amended to add the project(s) with an updated financial analysis. A preferred alternative for the US 51 (McFarland to Stoughton) corridor has been identified pending completion of the environmental study, however Major Highway Development program funding for the project is uncertain given the other potential Madison area projects for which such funding will be sought in the near future. If the US 51 (McFarland to Stoughton) project does not receive this funding, alternative sources may be needed and the project would then need to be completed in multiple segments over time.

Based on the funding for the Madison area projects enumerated for the Major Highway Development program for FYs 2014-2020, a total of $1.6 billion in inflation adjusted funding can be expected to be available during the planning period. This would cover the currently estimated inflation-adjusted cost of the Beltline/Interstate interchange ($550 million) with around $1 billion available for additional project(s). This would be sufficient to fund the Stoughton Road and US 51 projects should Major Highway Development program funding be sought for them or possibly the Beltline project. However, the region would need to garner a much larger percentage of the Major Highway Development program funding and/or total statewide funding would need to be significantly increased to fund the Beltline project, US 51 projects, and other needs such as the interstate in the Madison area. The Beltline project, which is expected to cost in excess of $1 Billion, would be expected to rate as a high priority under the project selection criteria, but would face competition from other major needs in the state, particularly on the southeast area freeway system.



Because the list of Major Highway Development program and other state highway construction projects is incomplete, a major surplus in funding remains, particularly in the last time period – 2035-2050. Because it is assumed that all available funding for construction will be expended, expenditures were adjusted to match revenues.

Public Transportation

Capital Costs

The single largest capital expense for Metro Transit by far is replacement buses. Metro typically replaces buses on a cycle of about 15 years. With a fleet of just over 200, it purchases about 15 new buses per year. Although the availability of traditional federal funding for replacement buses has decreased in recent years due to the elimination of discretionary transit capital funding in MAP-21 , Metro has been relatively successful in securing local and other federal funds necessary to maintain its fleet. MATPB awarded federal STBG Urban funds in 2015-'17 to purchase a total of 21 buses. Another major capital cost is the ongoing renovation of Metro's maintenance facility. Maintaining Metro's fleet replacement schedule, the facility renovation, and other usual capital expenses can be covered with projected revenues based on recent trends.

However, in order to fully implement the recommended transit system improvements there are some major new capital costs that will require significant additional funding. The two most immediate capital needs are a new bus storage and maintenance facility and bus rapid transit (BRT) infrastructure. In addition, new buses in the future will likely be electric and some may be longer, high-capacity articulated buses. The planned Nakoosa Trail bus storage and maintenance facility is estimated to cost about $35 million. Final design work for the facility will be done this year. The new facility is necessary for Metro to be able to expand its peak period service area and frequency, and to house and maintain articulated buses, which will be needed for the BRT system. Metro has unsuccessfully applied for discretionary federal TIGER grant funding in the past, but plans to apply again in 2017, assuming the program is continued.

Detailed costs for the planned BRT system are not known, but a feasibility study completed in 2013 estimated that the 20-mile system envisioned would cost between $105 and $155 million, excluding the cost for the bus storage and maintenance facility. Costs for BRT vary greatly based on the scope of the project. The system envisioned in the feasibility study includes new articulated buses, new stations, and some roadway modifications. A planned 2017 study will provide more detailed cost estimates for a first phase project, which could be constructed, and in service by 2021-'22. Capital funding is anticipated to be provided through a federal Small Starts program grant covering up to 80% of project costs. If other federal funding is not secured, the Small Starts grant could also cover up to one-half of the cost of the new satellite bus storage and maintenance facility, which is needed for the BRT buses. The City of Madison has included required local match funding for the starter BRT project and facility in its multi-year capital budget. Funding for the study and BRT project design is available from previous federal grants and state funding. Once the 2017 study is completed and the initial BRT project identified with an estimated cost, an amendment to the RTP is anticipated to add the project to the fiscally constrained, federally recognized plan.

New articulated and electric buses, as recommended in the plan, will be more expensive than the standard 40-foot diesel buses and hybrid-electric buses currently in use. Electric buses have become more common as the technology improves and the price drops. Articulated buses have been in use in the industry for many years. With the new service planned (bus rapid transit, new all-day service, frequency improvements, and regional express service), the fleet size is expected to grow by about 70 buses, including spares. If all of the recommended service improvements in the plan are implemented, the capacity of Metro's primary and planned satellite facilities will be largely exhausted. Future expansion of the fleet would require additional storage capacity.

Table 6-9 lists the major capital expenses necessary to fully implement the recommended transit improvements. The total estimated cost in today's dollars is over $300 million – far more than Metro is likely to receive based on historical trends. The recent average annual spending on capital needs is about $6 million, which is generally sufficient for meeting Metro's bus replacement needs, but not for expanding or upgrading the fleet. Some expansion of the fleet for new service and/or upgrading of the fleet to electric buses may be feasible with other federal funding and increased local funding, but implementation of the full suite of planned improvements would not be possible. Metro will need to fund the new maintenance facility to accommodate planned service expansion regardless of whether it pursues BRT.

While Metro may be able to secure discretionary federal grants for the Nakoosa Trail bus storage and maintenance facility and initial BRT project, funding the complete list of capital needs identified in the plan will likely require a regional funding mechanism.

Figure 6-9

Estimated Costs of Needed Transit System Capital Projects

Major Capital Expense	Estimated Cost in Millions
Bus Rapid Transit System with buses and Nakoosa Trail bus storage and maintenance facility	$165
Second satellite bus storage and maintenance facility	$35
Fleet expansion for new all-day service and regional express service	$30
Upgrade standard 40-foot buses to electric buses with some articulated buses	$75
Grand Total	**$305**

Operating Costs

Implementing the service improvements recommended in this plan will require an estimated additional 255,000 annual service hours, a 63% increase. See Figure 6-10. This planning-level estimate includes the BRT service, new all-day service, frequency improvements in central Madison, and the network of regional express bus routes. Assuming the service improvements are phased in over the approximately 34-year plan time-frame, the increase translates to about 1.5% per year.

Figure 6-10

Estimated Annual Service Hours for Recommended Regional Transit System

Service Category	Estimated Annual Revenue Service Hours	Estimated Cost in Millions
Existing Metro Transit Service	406,000	$55
Bus Rapid Transit	104,000	$14
New All-Day Service	88,000	$12
Frequency Improvements	7,000	$1
Regional Express Service	56,000	$8
Grand Total	**661,000**	**$90**

This 1.5% growth rate is considerably higher than Metro's historical growth rate of about 0.9% per year since 2003. Before 2003, there had actually been a trend of decreasing service hours following the route restructure and expansion in 1998. Between 2010 and 2015, Metro Transit's operating funding increased an average of 0.7% per year in constant 2015 dollars. This increase allowed for some increased service – in fact, during that same time period, service hours actually increased at an average of 1.4% per year. However, this level of funding would not provide the resources necessary to support the transit service recommendations in this plan. Because service hours rose faster than operating funding, some hours were added through improved efficiencies, and there are limits to these efficiency gains. Also, increased funding has come from local governments, and competing funding demands and the state expenditure restraint program make its continuation unlikely.

If the number of service hours was to increase at the same rate as operating funding has risen – 0.7% per year – Metro could expect to be able to operate about 112,000 additional annual service hours by 2050, slightly less than one-half of the service hours recommended in this plan. The remaining unfunded 143,000 annual service hours will require a new funding source. See figure 6-11.

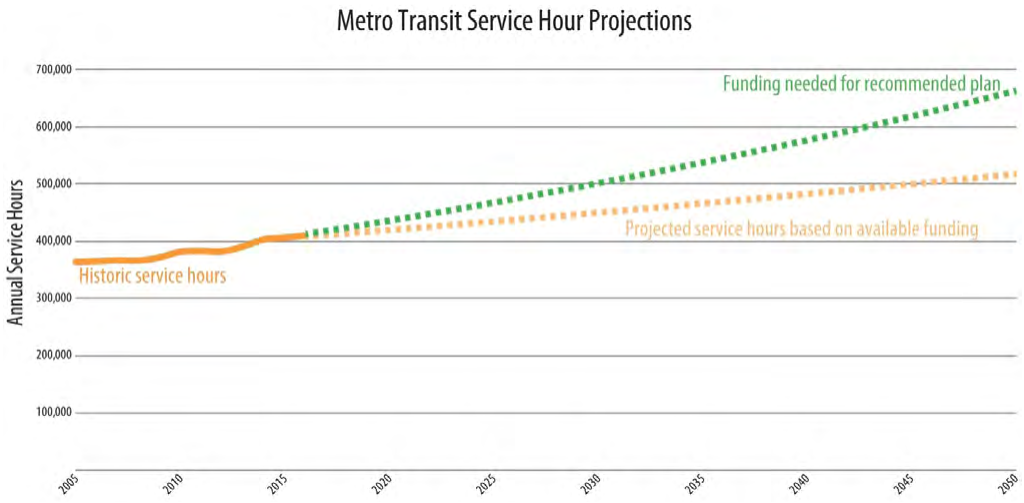


Figure 6-11: Metro Transit Service Hour Projections

Figure 6-12 identifies the types of revenue generation mechanisms that could be used to fund the expansion of the transit system as well as the estimated annual revenue generation of these sources. A vehicle registration fee alone would not be enough to fund the planned transit system, but would allow Metro to make targeted service expansions and pursue needed capital improvements. A ¼ percent sales tax would likely be sufficient to fund a steady implementation of the planned transit system while a ½ percent sales tax would act as a safeguard against future state and federal funding reductions, and allow faster implementation of the planned system. It is important to note that an RTA could be used to fund transit alone or all modes of transportation depending on the statutory language in the enabling legislation. The recommendations above assume all funds are allocated to transit. If funds are divided between modes, additional funding may be required to implement the planned transit system.

Figure 6-12

Estimated Annual Revenue Generated from New Taxing Authority

Revenue Source	Estimated Cost in Millions
RTA - ¼ % Sales Tax	$23
RTA - ½ % Sales Tax	$46
Vehicle Registration Fee - $20 per year	$8

Bicycle Projects

New urban arterial streets and high-volume collector streets are almost universally built with bicycle facilities. Urban arterial street reconstruction projects generally include bicycle facilities, where feasible, given right of way constraints and competing demands for the space. The cost of these facilities is included in the budget for street projects. Therefore, no additional need for funding is anticipated for on-street bicycle facilities beyond that projected for the roadway system. Major regional off-street facilities, such as shared-use paths, are generally stand-alone projects, although some side paths and grade-separated crossings are now being funded as part of roadway projects such as those on CTH M and CTH PD. The *2015 Bicycle Transportation Plan* identified a network of planned regional priority paths and estimated the cost for these projects. Figure A-2 in Appendix A lists these projects and a planning level cost estimate for them. There are also some major shared-use path and grade-separated crossing recommendations that have been identified as part of major state highway corridor projects, most notably the Beltline and Stoughton Road. It is expected that at least some of those projects would be funded as part of those projects.

Bicycle project costs were estimated for the *2015 Bicycle Transportation Plan* based on planning-level cost assumptions, taking into account the length of the path, character of the corridor, and presence of bridges and underpasses. Programmed projects were then assigned a construction year and, as with the roadway projects, the longer term projects were assigned to one of two time periods – 2021 to 2035 and 2036 to 2050. Project costs include a 2% per year inflationary factor. The costs of these regional priority projects, about $80 million in 2021-2035 and $114 million in 2036-2050, are forecasted to be within the projected funds

available ($90 million in 2021-2035 and $121 million in 2036-2050). Other path projects included in the bicycle facilities plan may be completed with urban development projects, in conjunction with roadway construction projects, or may be funded separately.

CONCLUSION

The financial capacity analysis for the RTP assumes a 2% annual inflationary increase in federal, state, and local funding. However, the state gasoline tax rate will need to be increased, or other new revenue sources (e.g., new mileage based registration fee) created, in order to offset inflationary increases in project costs. The state gas tax hasn't been increased since, 2006 when the automatic indexing of the gas tax and vehicle registration fees to the inflation rate was eliminated. The State Commission on Transportation Finance and Policy's report, *Keep Wisconsin Moving – Smart Investments, Measurable Results*, provided recommendations for generating additional revenue, but thus far the state legislature has not addressed the long-term solvency of the state transportation fund.

An increase in funding levels is necessary to maintain the existing condition of the region's roadway system. The overall condition of the state highway system has improved the past few years, but necessary major reconstruction projects loom on the horizon. Also, a WisDOT analysis of the statewide system indicates that spending at the same level as the current budget will result in a 93% increase in state highway miles rated in poor or worse condition by FY 2027. The overall condition of the local roadway system has been steadily deteriorating. It is difficult to estimate the level of increase in funding that would be necessary to maintain or improve the condition of local roadways in the region, but clearly the current level of funding is insufficient.

The financial analysis indicates that projected revenues will be sufficient to implement the state and local arterial roadway capacity expansion projects identified in Figure 5-2 in Chapter 5 and listed in Figure A-1 in Appendix A while at the same time addressing roadway preservation needs in a manner similar to recent trends. However, this means that roadway conditions, at least on the local system, will continue to slowly deteriorate. Major capacity improvements in two state highway corridors (Stoughton Road, Beltline) currently being studied would probably not all be able to be fully funded with current funding levels – the Beltline project alone is expected to cost over $1 billion. Major Highway Development program projects funding, which is provided on a statewide discretionary basis, will be sought for these projects. Some local arterial capacity expansion needs will not be able to be addressed without additional funding, most notably the western segment of the planned North Mendota Parkway.

Significant new transit funding will be needed to implement the recommended regional transit service improvements, including BRT, new regional commuter service, and increased local service frequencies in high-demand corridors. The estimated costs to fully implement the plan include over $300 million in capital costs and a 63% increase in annual service hours at an estimated additional annual cost of $45 million. Implementation of these improvements will likely require a new regional funding mechanism, such as a regional transit authority, with the ability to levy a sales tax. It is estimated that a ½ cent sales tax today would generate $46 million annually.

Current funding levels, adjusted annually for inflation, would be sufficient to fund the major regional priority path projects illustrated in Figure 5-8 in Chapter 5 and listed in Figure A-2 in Appendix A. These projects were identified as needed to address key gaps and barriers, and complete the planned primary regional network found in Figure 5-10 in Chapter 5. Additional identified projects would need to be completed in conjunction with new development, as part of roadway construction projects or with additional funding. On-street facilities are assumed to be included as part of roadway projects.

Regional Transportation Plan 2050

Madison Area

Charting Our Course



Madison Area T • P • B

Transportation Planning Board

A Metropolitan Planning Organization

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Regional Transportation Plan 2050

for the Madison Metropolitan Area

Adopted April 5, 2017 by the

Madison Area Transportation Planning Board

121. S. Pinckney St., Suite 400

Madison, WI 53703

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The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation or WisDOT.

Resolution TPB No. 126

Adopting the Regional Transportation Plan 2050 for the Madison Metropolitan Area

WHEREAS, the Madison Area Transportation Planning Board (MATPB) is the designated Metropolitan Planning Organization (MPO) for the Madison, Wisconsin Metropolitan Area with responsibilities to perform regional transportation planning and programming, in cooperation with the Wisconsin Department of Transportation and Metro Transit, the major transit operator; and

WHEREAS, one of the primary responsibilities of the MATPB is to prepare and approve a long-range regional transportation plan in accordance with the Fixing America's Surface Transportation (FAST) Act (23 U.S.C. 104, 134) and implementing U.S. Department of Transportation (DOT) regulations (23 C.F.R. 450); and

WHEREAS, the regional transportation plan is a multi-modal transportation systems plan that defines the goals for the region and specifies the policies, projects, and strategies to help achieve these goals, and also ties the goals to performance measures to be used to track the region's progress in meeting plan goals over time; and

WHEREAS, the MATPB has updated the current adopted plan, the *2035 Regional Transportation Plan Update*, and extended the planning horizon from the year 2035 to 2050 using new population, household, and employment forecasts and revised travel demand forecasts to the year 2050; and

WHEREAS, the MATPB has followed the prescribed federal guidance for development of regional transportation plans as set out in the Metropolitan Transportation Planning rule, 23 C.F.R. 450 in the preparation of the plan, including consideration of the federal planning factors, identification of performance measures, and preparation of financial, environmental, and environmental justice analyses of the plan; and

WHEREAS, the MATPB's public involvement process for the plan included use of an interactive plan website where materials, including the draft plan, and notices of meetings were posted, oversight by a plan advisory committee to guide the planning process, a regional values and priorities survey, three series of public meetings throughout the process, other presentations and updates, and a March 1 public hearing on the draft plan, and comments have been considered throughout the process and changes made to draft materials and the draft plan as determined to be appropriate; and

WHEREAS, the regional transportation plan is intended to guide implementing agencies in development of projects and implementation of other recommendations and supporting actions to guide improvements for all modes of transportation until the next major update of the plan in five years; and

WHEREAS, in the meantime the MATPB commits to working with WisDOT and Metro Transit to identify the performance targets for the federal required transportation system performance measures as these measures are finalized, implement other requirements of the new

performance-based approach to planning, and annually prepare a performance measures report indicating progress achieved in reaching the selected targets for the federal measures as well as progress on the other measures selected by the MATPB to gauge success in achieving the goals of the regional transportation plan:

NOW THEREFORE BE IT RESOLVED, the MATPB adopts the *Regional Transportation Plan (RTP) 2050 for the Madison Metropolitan Area*, which incorporates the changes to the Draft RTP 2050, dated February 2017, listed in the Addition/Change sheet dated April 5, 2017, as the official transportation plan for the region to serve as a guide for transportation planning, system development, and investments and as the basis for the MATPB's review of proposed projects in the Transportation Improvement Program; and that this plan supersedes the *2035 Regional Transportation Plan Update*.

BE IT FURTHER RESOLVED that the MATPB certifies that the federal metropolitan transportation planning process is addressing major issues facing the metropolitan area and is being conducted in accordance with all applicable federal requirements, including:

1. 23 U.S.C. 134 and 49 U.S.C. 5303, and this subpart;
2. Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d-1) and 49 C.F.R. Part 21;
3. 49 U.S.C. 5332, prohibiting discrimination on the basis of race, color, creed, national origin, sex, or age in employment or business opportunity;
4. Sections 1101(b) of the Fixing America's Surface Transportation (FAST) Act (Pub. L. 114-357) and 49 C.F.R. Part 26 regarding the involvement of disadvantaged business enterprises in U.S. DOT funded projects;
5. 23 C.F.R. Part 230, regarding the implementation of an equal employment opportunity program on Federal and Federal-aid highway construction contracts;
6. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) and 49 C.F.R. Parts 27, 37, and 38;
7. The Older Americans Act, as amended (42 U.S.C. 6101), prohibiting discrimination on the basis of age in programs or activities receiving Federal financial assistance;
8. 23 U.S.C. 324 regarding the prohibition of discrimination based on gender; and
9. Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794) and 49 C.F.R. 27 regarding discrimination against individuals with disabilities.

04/05/2017
Date Adopted

Al Matano, Chair
Madison Area Transportation Planning Board

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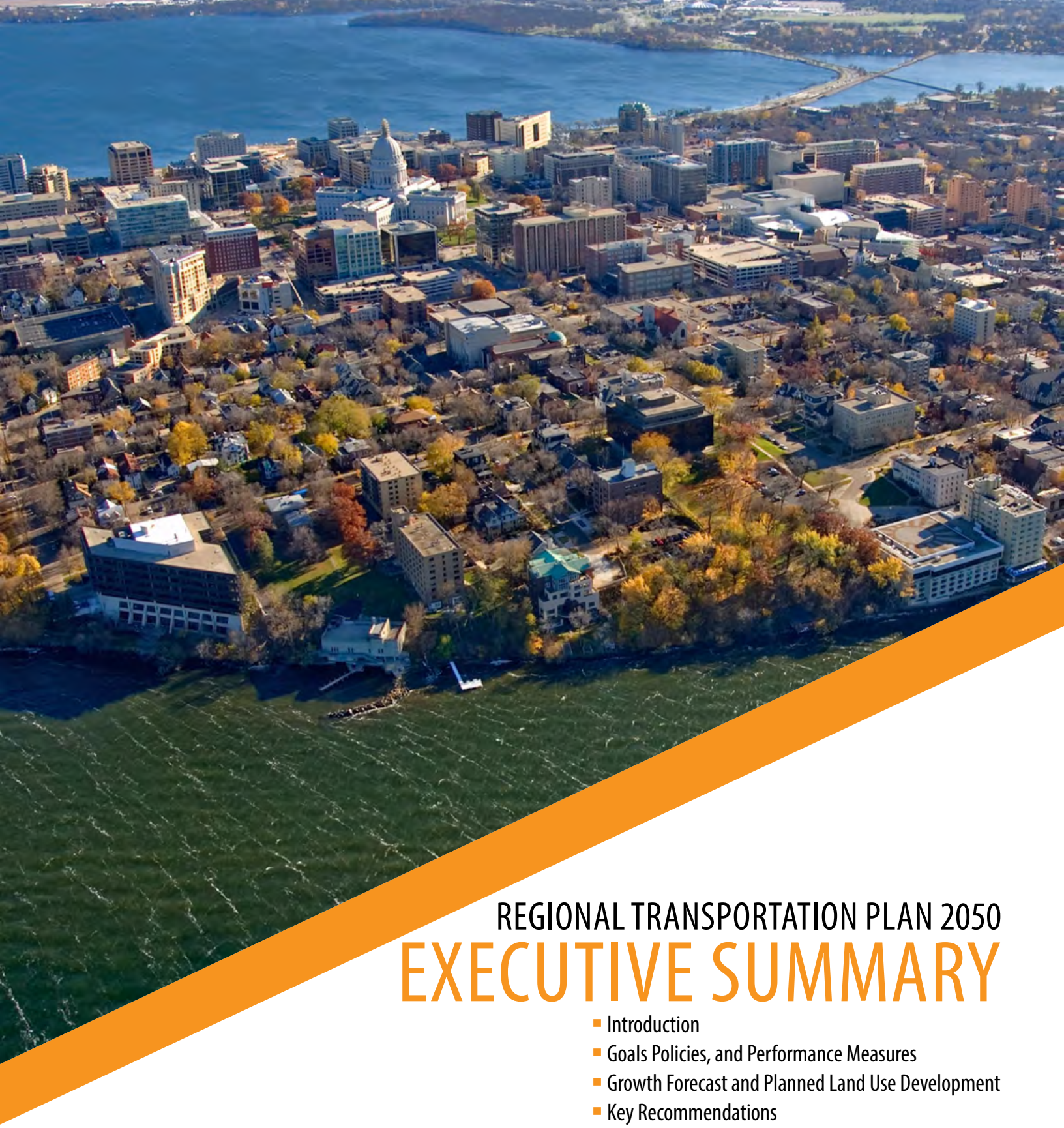
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List of Acronyms

ACS	American Community Survey
ADA	Americans with Disabilities Act (1990)
ADAD	Advanced Driver Assistance Systems
ADT	Average Daily Traffic
AWT	Average Weekday Traffic
BIC	Beltline-Interstate Interchange
BLS	Bureau of Labor Statistics
BR	Bridge Replacement Rehabilitation Program
BRT	Bus Rapid Transit
CAC	Citizen Advisory Committee
CARPC	Capital Area Regional Planning Commission
CBD	Central Business District
CMP	Congestion Management Process
CO2	Carbon Dioxide
CP	Canadian Pacific Railroad
CRSC	Capital Region Sustainable Communities Consortium
CRFC	Critical Rural Freight Corridor
CSS	Context Sensitive Solutions
CTH	County Trunk Highway
CUFS	Critical Urban Freight Corridor
DCDHS	Dane County Department of Human Services
DCRA	Dane County Regional Airport
DCRTA	Dane County Regional Transit Authority
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	Environmental Protection Agency
FAST Act	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FUDA	Future Urban Development Area
FY	Fiscal Year
GIS	Geographic Information System
GPS	Global Positioning System
GTA	General Transportation Aids
HSIP	Highway Safety Improvement Program
HSMO	Highway System Management and Operations Program
HUD	U.S. Department of Housing and Urban Development
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITS	Intelligent Transportation Systems
LED	Light Emitting Diode
LEED	Leadership in Energy and Environmental Design
LEHD	Longitudinal Employer-Household Dynamics (Survey)
LOS	Level of Service
LRIP	Local Roads Improvement Program
MAP-21	Moving Ahead for Progress in the 21st Century Act
MATC	Madison Area Technical College/Madison College
MATPB	Madison Area Transportation Planning Board
MPO	Metropolitan Planning Organization
MUTCD	Manual on Uniform Traffic Control Devices
NBI	National Bridge Inventory
NEPA	National Environmental Policy Act
NHFN	National Highway Freight Network
NHFP	National Highway Freight Program
NHPP	National Highway Performance Program
NHS	National Highway System Program
NHTS	National Household Transportation Survey
NHTSA	National Highway Traffic Safety Administration
NMFN	National Multimodal Freight Network
NTD	National Transit Database
O/D	Origin - Destination
O & M	Roadway Operations and Maintenance Costs
QCEW	Quarterly Census of Employment and Wages
PASER	Pavement Surface Evaluation and Rating
PCI	Pavement Condition Index
PDI	Pavement Distress Index
PEL	Planning and Environmental Linkages
PHFS	Primary Highway Freight System
PM 2.5	Fine particulate matter suspended in air
PNR	Park-and-Ride
ROW	Right of Way
RSVP	Retired Senior Volunteer Driver Escort Program
RTA	Regional Transit or Transportation Authority
RTP	Regional Transportation Plan
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SASY	Schenk-Atwood-Starkweather-Yahara Neighborhood
SHR	State Highway Rehabilitation
SHSP	Strategic Highway Safety Plan
SOV	Single Occupant Vehicle
SRTS	Safe Routes to School
STBG	Surface Transportation Program Block Grant
STH	State Trunk Highway
STOC	State Traffic Operations Center
STP	Surface Transportation Program
TAP	Transportation Alternatives Program
TAZ	Traffic Analysis Zone
TCC	Technical Coordinating Committee
TDM	Travel Demand Management
TDP	Transit Development Plan
TID	Tax Increment District
TIGER	Transportation Investment Generating Economic Recovery (Grant Program)
TIP	Transportation Improvement Program
TMA	Transportation Management Area
TOD	Transit-Oriented Development
TOIP	Transportation Operations Infrastructure Plan
TOPS	(UW-Madison) Traffic Operations and Safety (Laboratory)
TPC	Transportation Projects Commission
TSM	Transportation Systems Management
UAFP	Urbanized Area Formula Program
UAS	Unmanned Aircraft System
UAV	Unmanned Aerial Vehicle
UP	Union Pacific Railroad
UPWP	Unified Planning Work Program
USA	Urban Service Area
USDOT	United States Department of Transportation
USH	U.S. Highway
UW	University of Wisconsin
V/C	Volume-to-Capacity Ratio
VMT	Vehicle Miles Traveled
V2I	Vehicle to Infrastructure Communication
V2V	Vehicle to Vehicle Communication
WisDNR	Wisconsin Department of Natural Resources
WisDOA	Wisconsin Department of Administration
WisDOT	Wisconsin Department of Transportation
WISLR	Wisconsin Information System for Local Roads
WRRTC	Wisconsin River Rail Transit Commission
WSOR	Wisconsin & Southern Railroad Company
3C	Continuing, Comprehensive, and Cooperative Transportation Planning Process
3-E	Engineering, Education, and Enforcement



REGIONAL TRANSPORTATION PLAN 2050
EXECUTIVE SUMMARY

- Introduction
- Goals Policies, and Performance Measures
- Growth Forecast and Planned Land Use Development
- Key Recommendations

INTRODUCTION

Dane County's population and economy are growing and changing. The population is becoming more diverse and the economy is becoming more private sector oriented with job growth at the higher and lower ends of the economic spectrum. While the City of Madison continues to garner a large share of this growth, its share of population and employment has declined and is expected to continue to do so. Within the city, however, a higher percentage of new housing and employment is locating in redevelopment areas, most notably East Washington Avenue. A safe, efficient, integrated multimodal regional transportation system is needed to support this growth.



The Greater Madison Region Values and Priorities survey, conducted in early 2016, identified the key factors that make the region attractive to residents, regional values, and perceived needs for the future. Results of the survey demonstrated that regional growth is due to many factors – an excellent educational system, a robust economy, local agriculture, a strong sense of community, and access to nature and outdoor recreation – which have led to a high quality of life and positive regional outlook. Six out of ten survey participants believed that "lots more growth will be coming to this region whether we want it or not – the best thing we can do is prepare for it." At the same time, seven out of ten of participants believed regional growth "has and will continue to bring many benefits and advantages to the region . . . and should be strongly encouraged and fostered." Perhaps unsurprisingly, 67% of participants believed that it was very or extremely important to have a long range plan for growth while 81% agreed that "investing in regional transportation is an important priority for the region."



The Regional Transportation Plan (RTP) 2050 is the Madison region's blueprint for its future multimodal transportation system. The plan builds upon previous RTPs, with updated analysis, growth forecasts, goals, and policies. The plan also builds upon recent and ongoing MPO, WisDOT, and local plans and studies such as the MPO's Madison Transit Corridor – Investigating Bus Rapid Transit Study and the Bicycle Transportation Plan for the Madison Metropolitan Area. Finally, the plan includes some updates to meet new federal requirements, most notably related to performance management. Planning is a continuing process, and the RTP will be updated again in five years.



GOALS, POLICIES, AND PERFORMANCE MEASURES

The goals and policies in the RTP build upon those identified in previous planning efforts, refined through outreach with the public and key stakeholders. Throughout the goals and policies, the principles of sustainability are prominently featured:

- Social Equity: The transportation system should be designed to provide an equitable level of services to all segments of the population across all modes.
- Environment: The transportation system should be designed and operated within the context of its environment, minimizing negative impacts and fostering efficient development patterns that optimize travel, housing, and employment choices. The system should support existing and planned development and discourage growth in rural areas.
- Economy: The transportation system should ensure that businesses have maximum opportunities to serve customers, reach clients, export goods, and obtain workers. The system should play a significant role in raising the region's standard of living and quality of life.



The goals featured in the plan began as a set of aspirational statements about desired outcomes that the region would work towards achieving. These were refined into a set of goals to guide the plan's policy and project recommendations:

1. Create Connected Livable Neighborhoods and Communities: Create interconnected livable places linked to jobs, services, schools, shops, and parks through a multi-modal transportation system that is integrated with the built environment and supports compact development patterns that increase the viability of walking, bicycling, and public transit.
2. Improve Public Health, Safety, and Security: Design, build, operate, and maintain a transportation system that enables people to get where they need to go safely and that, combined with supportive land use patterns and site design, facilitates and encourages active lifestyles while improving air quality.
3. Support Personal Prosperity and Enhance the Regional Economy: Build, operate, and maintain a transportation system that provides people with affordable access to jobs and enables the exchange of goods and services within the region and to/from other regions.
4. Improve Equity for Users of the Transportation System: Provide an equitable level of transportation facilities and services for all regardless of age, ability, race, ethnicity, or income.
5. Reduce the Environmental Impact of the Transportation System: Ensure that the transportation system is designed, built, operated, and maintained in a way that protects and preserves the natural environment and historic and cultural resources, and is supportive of energy conservation.
6. Advance System-wide Efficiency, Reliability, and Integration Across Modes: Design, build, operate, and maintain an efficient transportation system with supportive land use patterns that maximize mobility, minimizes unexpected delays, and provides seamless transfers between all modes.
7. Establish Financial Viability of the Transportation System: Achieve and maintain a state of good repair for the existing transportation system, invest in cost-effective projects, and ensure adequate, reliable funding to meet current and future needs.

Each goal is supported by a number of policies that provide a structure for regional project prioritization and transportation decision-making. The goals and policies are tied to a number of performance measures, including some federally required measures that correspond to national transportation system performance goals as well. The purposes of this performance based approach are to ensure that investment decisions are made based on objective information and to improve communications between decision-makers, stakeholders, and the public while achieving regional, state, and national performance goals.

GROWTH FORECASTS & PLANNED LAND USE DEVELOPMENT

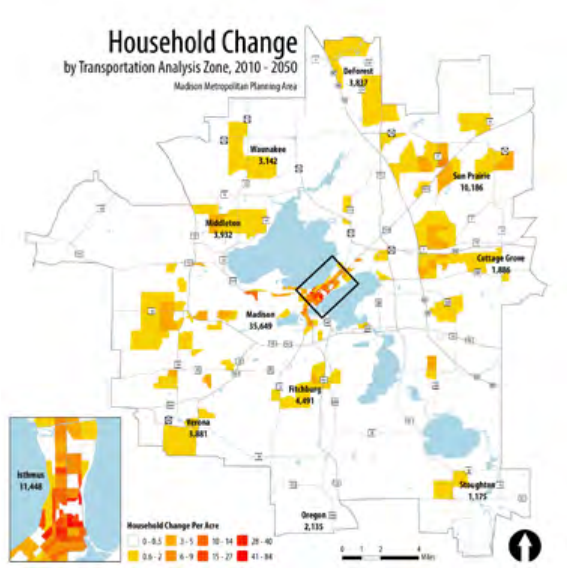
The Madison region has been growing steadily for several decades. The population, household, and employment forecasts used for development of the RTP were prepared by the Capital Area Regional Planning Commission and reflect recent trends. This includes the trend of many suburban communities' population growing at faster rates than the City of Madison and also increased commuting by workers into Dane County from adjacent counties.

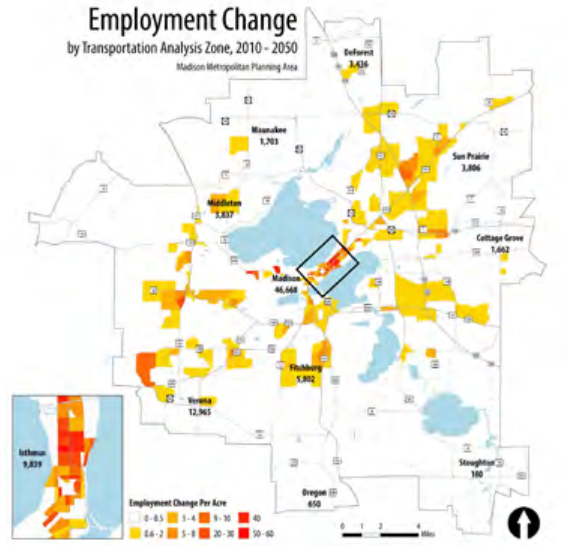
Between 2010 and 2050, the City of Madison's population is projected to increase by 57,900, or 25%, while the regional population will increase by 149,350, or 31%, for a total future population of 637,450 within the metropolitan planning area. During this time, the average size of household in the region is expected to continue to decline, while the aged population increases, and the region becomes increasingly diverse.

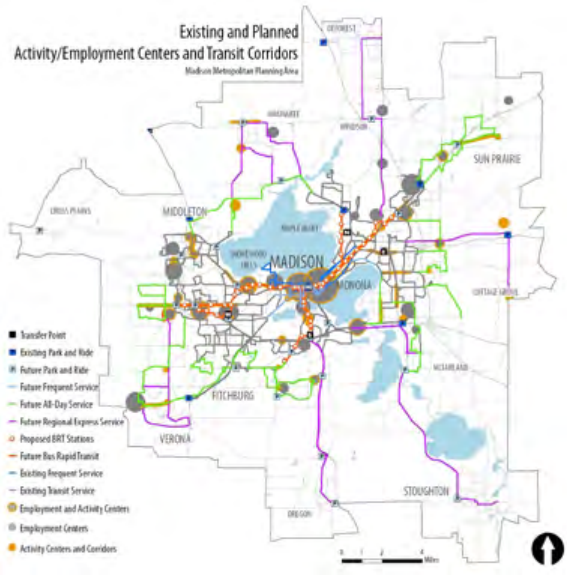
Dane County's employment is forecast to increase from 314,000 to 398,700, while the 2050 resident employed labor force is projected to be 316,300. Assuming the percentage of Dane County workers working in other counties remains at 5.3%, the number of workers commuting into the county from other counties would increase to 99,100, a 136% increase from today's numbers. This reinforces the need for regional transportation improvements, including an increase in options to driving alone. Roughly 53% of the new jobs are projected to be located in the City of Madison, with all but about 2,000 of the remainder in the rest of the metro area.

Travel demand is dependent upon the location, density, and mixture of land uses. The allocation of future growth was based on the regional land use policy plan and local comprehensive plans. It reflects both regional and City of Madison policy to encourage development in higher density, mixed-use centers and corridors with existing and planned high capacity and frequent transit service.

Within the City of Madison, over one-half of new housing units were allocated to infill/redevelopment areas as opposed to peripheral "greenfield" areas, reflecting recent trends, with 11,500 new units located in the Isthmus area along with almost 10,000 new jobs. This compact, centers and corridors based land use development pattern was used to develop future travel forecasts. The map to the right shows how the recommended transit system could serve and connect existing and planned mixed-use activity centers and corridors and employment centers.







KEY RECOMMENDATIONS

Recommendations include a mixture of policies, strategies, studies, and projects. Key recommendations include:

Land Use and Transportation Integration

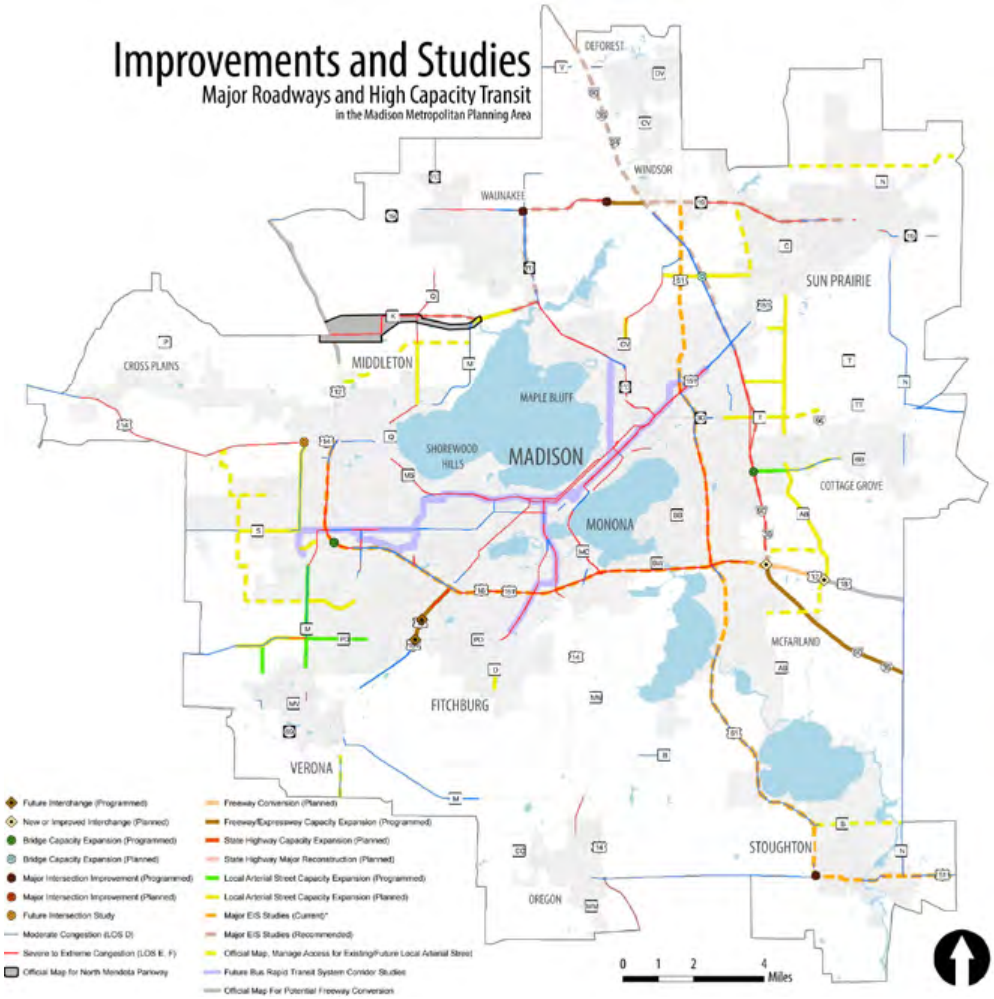
- Adopt local land use plans and policies that support land use related RTP goals and policies.
- Develop urban areas with a mix of housing types and land uses to provide walkable, affordable neighborhoods.

Streets and Roadways

- Preserve and maintain the region's street and highway system.
- Build a well-connected network of regional roadways to accommodate future growth and efficiently distribute traffic.
- Incorporate complete streets and green streets concepts for regional and local roadways.
- Expand regional roadway system capacity to address critical bottlenecks and accommodate future planned growth consistent with RTP goals and policies.
- Address safety needs on the regional roadway system through a comprehensive "3-E" approach.

Public Transit

- Implement a BRT system.
- Improve the local bus network.
- Add all-day service in developing neighborhoods.
- Enhance transit stops.
- Utilize alternative service delivery models to serve low-demand areas.
- Implement a regional express bus network.
- Expand park-and-ride facilities in conjunction with BRT and express services.
- Implement a regional transit entity with stable funding and representative governance.



Bicycles

- Expand the bikeway network with new shared-use paths and on-street facilities.
- Maintain and modernize existing bicycle facilities.
- Eliminate bicycle barriers and hazards in the bikeway network.
- Provide adequate bicycle parking.
- Improve bicyclist safety through a "3-E" approach.
- Continue bike share, education, and bicycle supportive policies.

Pedestrians

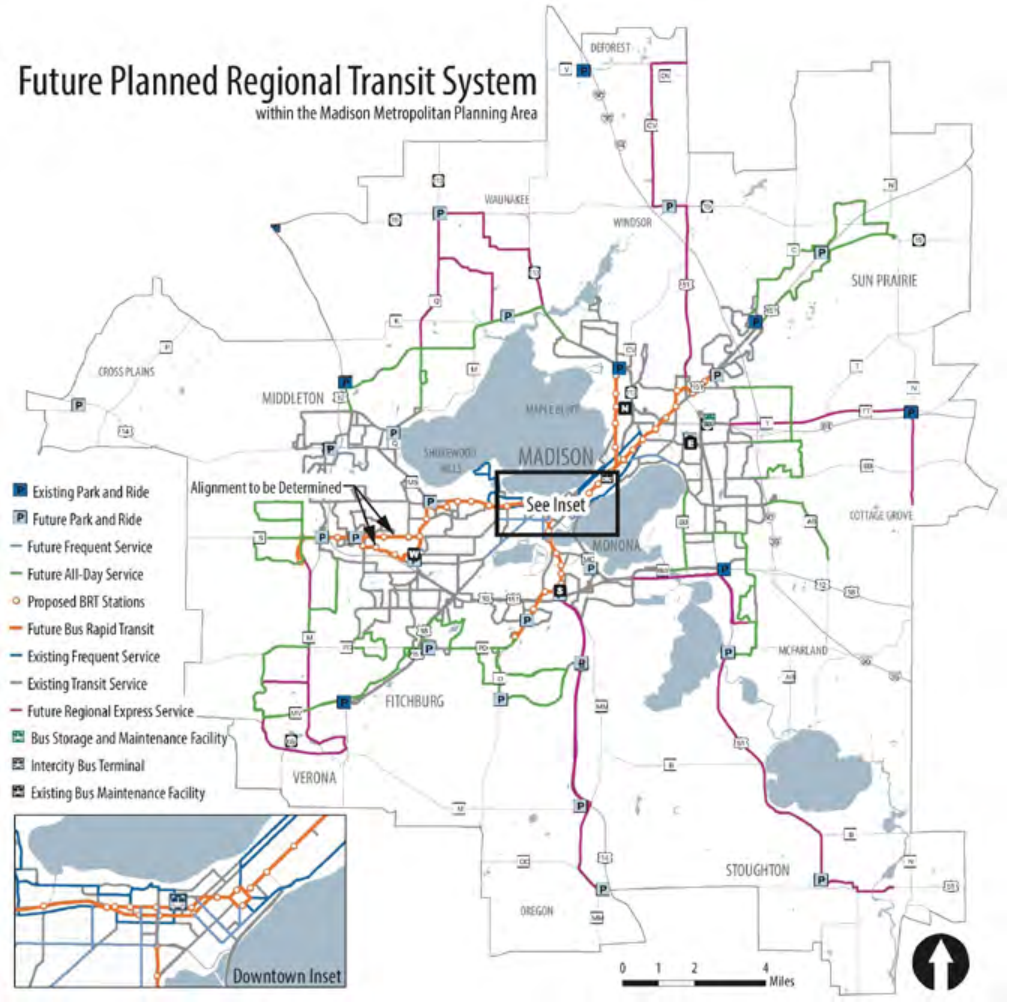
- Provide sidewalks and appropriate pedestrian amenities in developing neighborhoods.
- Retrofit regional streets with modern, safe pedestrian accommodations.
- Improve safety and usability for pedestrians at intersections and crossings.
- Maintain sidewalks and pedestrian facilities for year-round use.
- Design new streets and retrofit existing streets to reduce speeding.

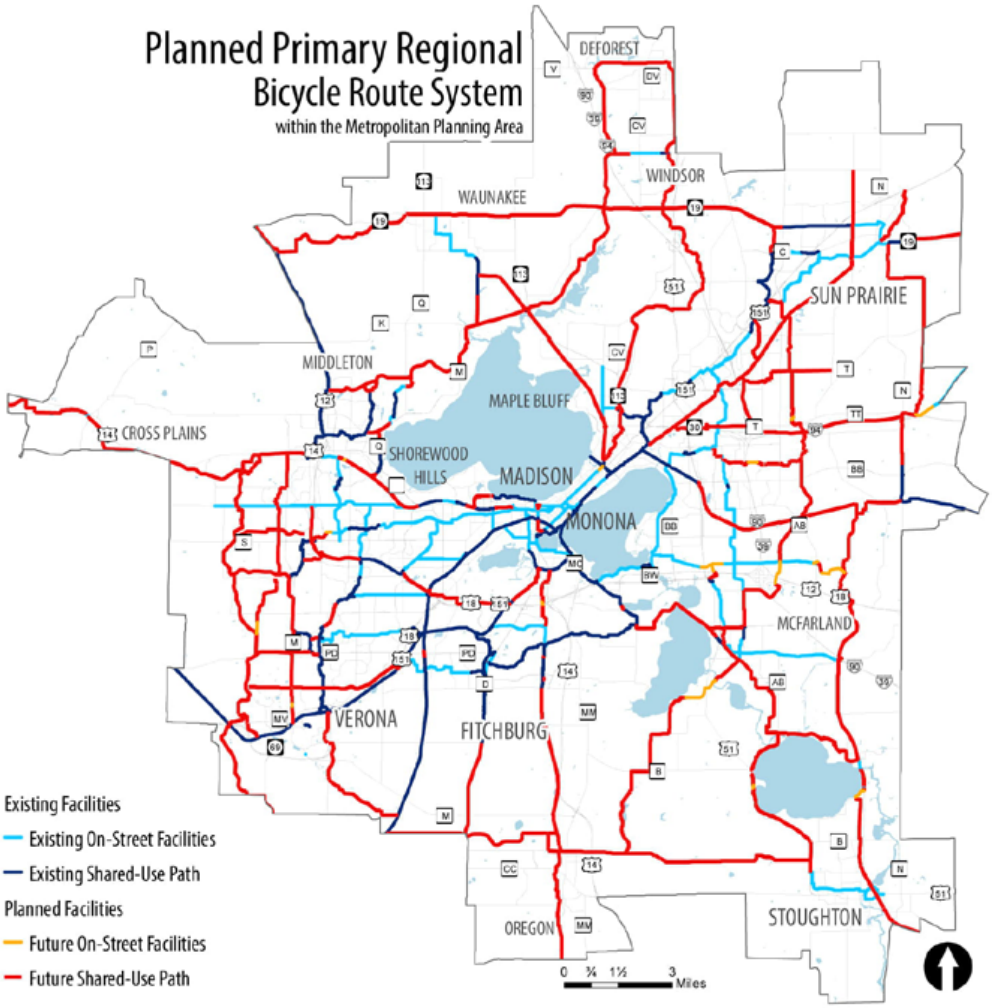
Inter-regional Travel

- Initiate planning for and build an inter-city bus terminal.
- Support new and improved inter-city bus service.
- Maintain and preserve the rail network for future passenger rail service.

Specialized Transit

- Expand the coverage of accessible fixed-route bus and paratransit service.
- Work collaboratively with private taxi operators to ensure accessible taxi service is available and costs for the service are shared equitably.
- Continue and expand specialized work-based transportation for low-income people.
- Utilize emerging technologies to lower operating costs and expand travel options.
- Improve interagency coordination of the various specialized transit services and private services.





Travel Demand Management (TDM)

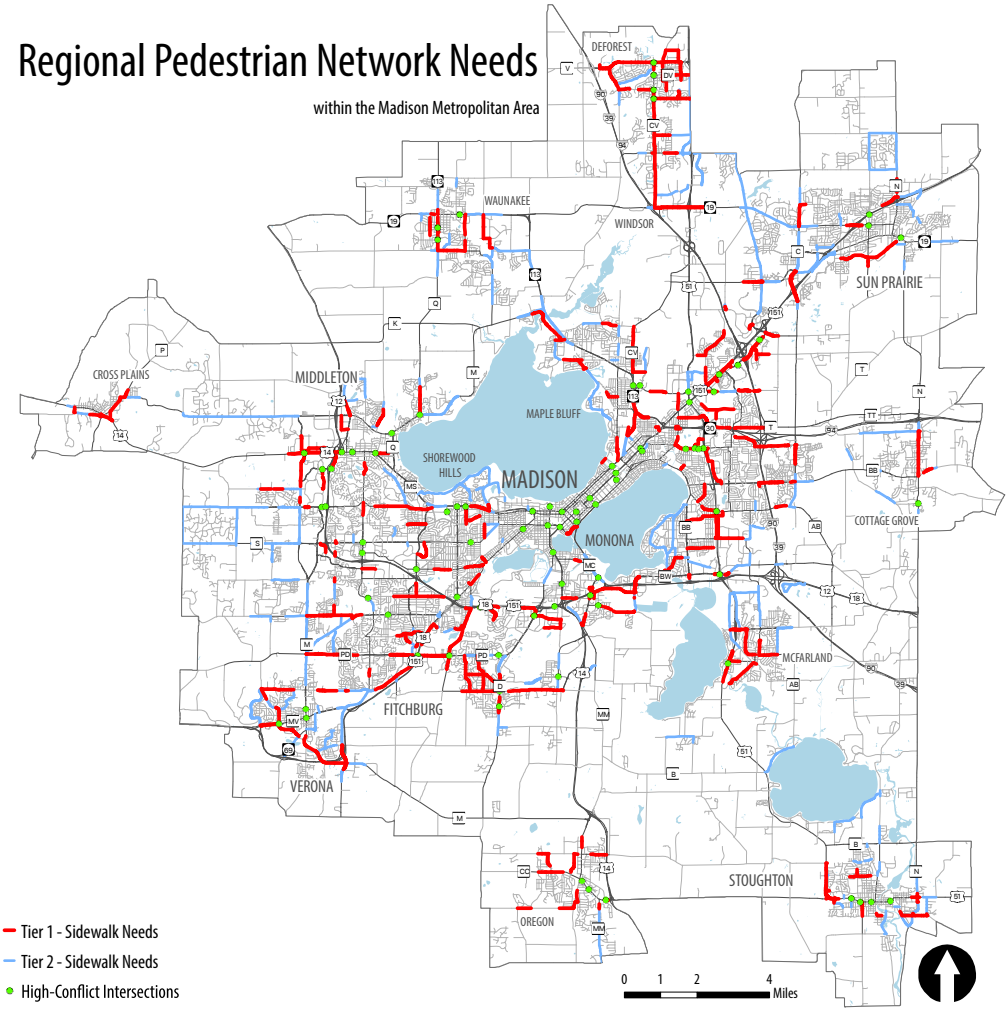
- Expand the regional network of park-and-ride lots to encourage carpooling, transit use, and bicycling.
- Expand the state vanpool program and support the development of additional vanpool programs.
- Continue to encourage and provide support to large employers, institutions, and municipalities to develop and promote strategies to reduce single-occupant motor vehicle trips.
- Provide financial incentives for people to use alternative transportation and increase funding for marketing programs.
- Support transportation options at schools through Safe Routes to School programs.

Transportation System Management (TSM), Operations, and Intelligent Transportation Systems (ITS)

- Expand the regional network of park-and-ride lots to encourage carpooling, transit use, and bicycling.
- Expand the state vanpool program and support the development of additional vanpool programs.
- Continue to encourage and provide support to large employers, institutions, and municipalities to develop and promote strategies to reduce single occupant motor vehicle trips.
- Provide financial incentives for people to use alternative transportation and increase funding for marketing programs.
- Support transportation options at schools through Safe Routes to School programs.

Freight, Air, and Rail

- Maintain and promote new industrial uses along freight corridors.
- Maintain and expand existing infrastructure on the multimodal freight network, prioritizing projects that improve safety, increase efficiency, and minimize lifetime costs.
- Increase focus on freight planning for regional and local transportation facilities.
- Maintain the availability of rail facilities for current and future uses.
- Mitigate conflicts between rail and other uses.
- Ensure the compatibility of uses near airports.



- Improve airport facilities to enhance usability and convenience for passenger traffic.
- Improve the airport's freight accommodations and connections.

Parking

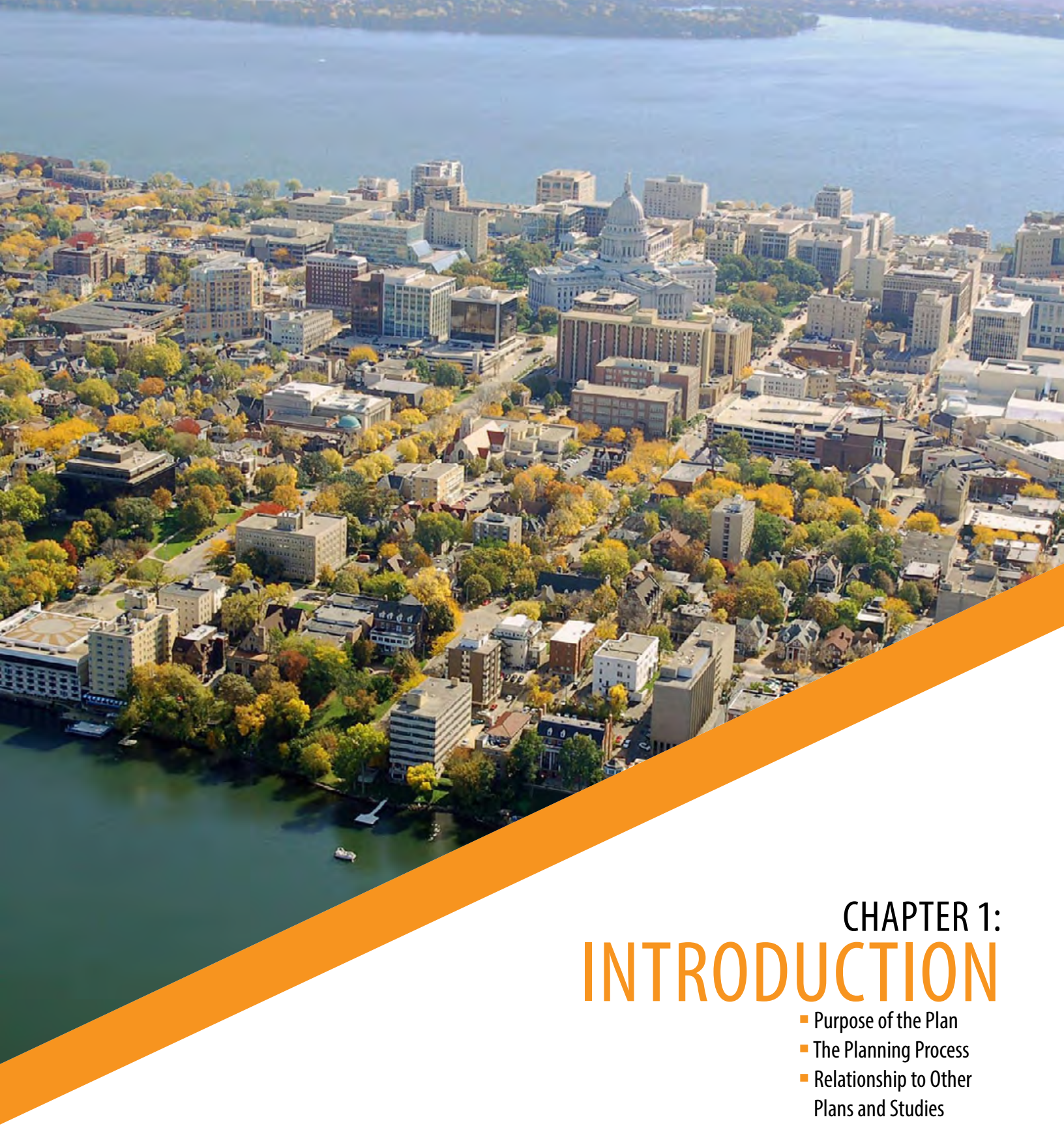
- Use parking management strategies to reduce congestion within downtown areas and major activity centers.
- Modify parking requirements to encourage multi-modalism and innovative design using a more market-based approach.
- Ensure flexibility of parking facilities to accommodate future technologies.

For more information contact:

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A Metropolitan Planning Organization

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The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation or WisDOT.



CHAPTER 1: INTRODUCTION

- Purpose of the Plan
- The Planning Process
- Relationship to Other Plans and Studies
- Stakeholder Involvement and Public Outreach

PURPOSE OF THE PLAN

The Madison Region is Growing

Since 2000, over 22% of the state of Wisconsin's population growth occurred within Dane County. A highly urban county, nearly 90% of the county population lives in the Madison Urban Area. During the same time period, employment within the county grew by nearly 37,000. As the region grows and evolves, it will need an efficient, safe, and integrated transportation system. The system must provide a mix of transportation choices – walking, biking, transit, and driving – that provide a variety of ways to access jobs, recreational facilities, shops, restaurants, and other communities.

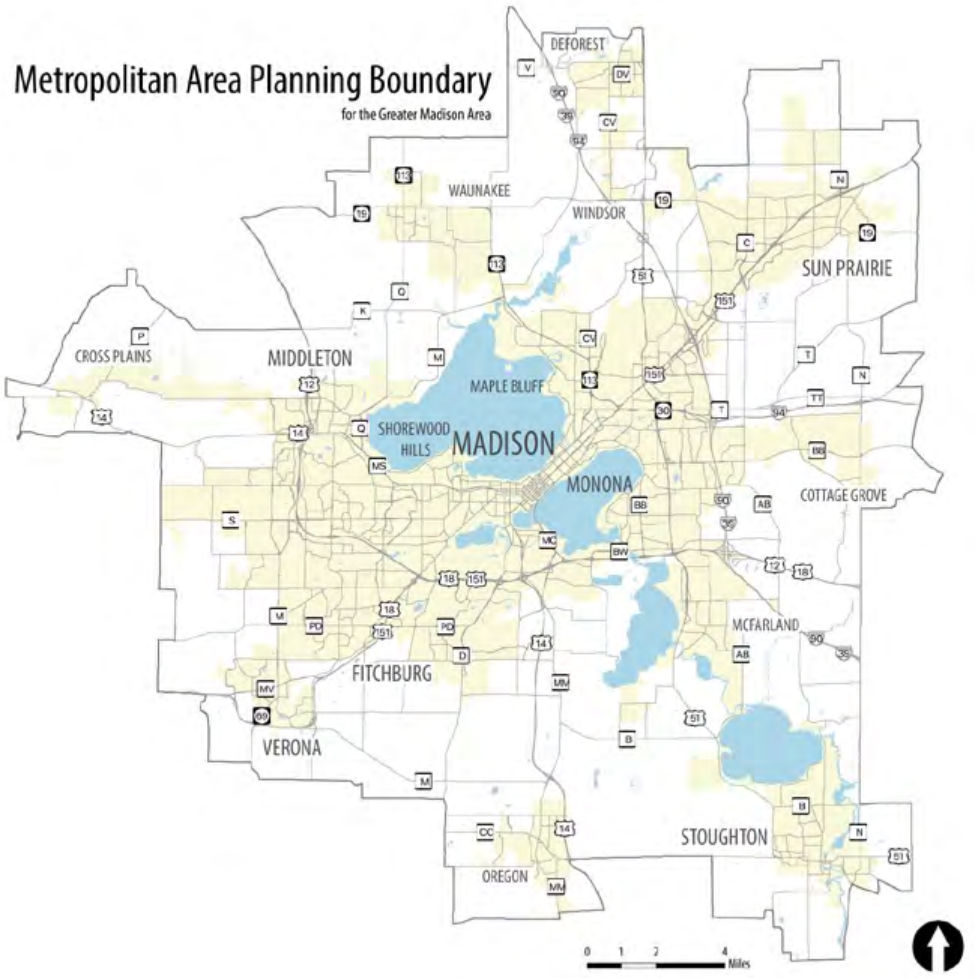


Figure 1-1: MATPB Planning Boundary

The purpose of this plan is to identify how the region will invest in the transportation system across all modes over the next 30+ years. The plan will ensure that transportation projects are coordinated between the various levels of government (municipal, county, and state.)

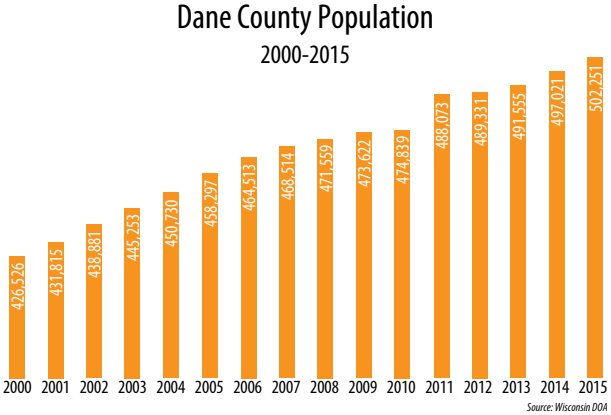


Figure 1-2: Dane County Population 2000 - 2015

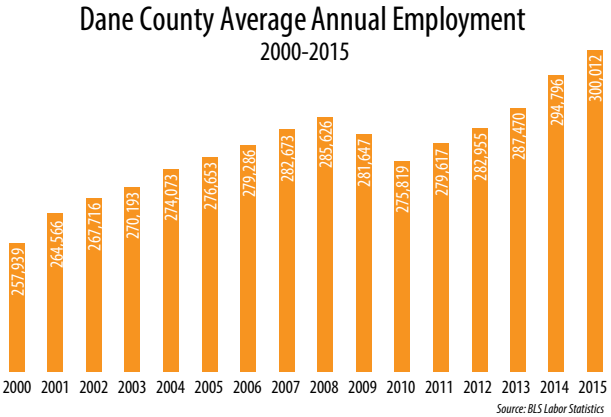


Figure 1-3: Dane County Average Annual Employment 2000 - 2015

Why is the Transportation System Important?



In late 2015, the Madison Area Transportation Board (MATPB), the Metropolitan Planning Organization (MPO) for the Madison area, teamed with the Capital Area Regional Planning Commission (CARPC) on the Greater Madison Region Values and Priories Survey. The purpose of the survey was to determine the values and priorities of area residents to ensure that planning decisions speak to and correspond with the desires of the region's residents.

Results of the survey show that financial well being – the ability to afford to live in the region – is the value driving most regional residents. To that end, the transportation system is critical to the economic success of residents and businesses in the region.

For businesses, a well-developed transportation network allows for the quick and efficient movement of services and goods. For example, "just-in-time" delivery has been used in the manufacturing industry as an inventory management strategy. The businesses increase their efficiency and reduce their overhead by receiving raw materials or production inputs just before they are needed in the production process. In the retail, restaurant, and hospitality industries,it is important to have a network that is reliable and convenient to ensure a steady stream of customers. For biotech and software businesses, convenient access to an airport for freight shipments and business flights could be the difference between locating in the region or not. A high quality transportation system with transit and bicycling options is also important for businesses in attracting young, educated, and skilled workers. National surveys have shown this is one of the top criteria of Millennials in choosing where to live.

For residents, an integrated multi-modal transportation system provides multiple options for commuting, shopping, leisure, and regional travel. Transportation also impacts neighborhood and community affordability, as well as the viability of community development. The transportation network also has a direct impact on the quality of life in the region. Safe and efficient regional transportation facilities ensure convenient business and leisure travel. An integrated, well-connected network makes traveling by all modes more convenient and enjoyable. The network can also help to foster community with streets acting as community, gathering and meeting spaces.

The Role of the Metropolitan Planning Organization

MPOs, such as MATPB, are statutorily required in all urbanized areas with a population of more than 50,000. As required by federal law, MPOs are policy boards comprised of mostly local elected officials that perform six core functions:

1. Establish a setting for effective transportation planning and decision-making that is a fair and impartial.
2. Identify and evaluate transportation improvement options, and use data and planning methods to determine whether the options support long-range regional goals and system performance targets.
3. Prepare and maintain a Regional Transportation Plan (RTP).
4. Develop and maintain a Transportation Improvement Program (TIP).
5. Identify performance measure targets and monitor whether implemented projects are achieving targets.
6. Involve the general public and other affected constituencies in the planning process.

During the RTP, TIP, and Unified Planning Work Program (UPWP)[1] development and maintenance processes, MPOs engage state departments of transportation, transit providers, and local municipalities in a continuing, comprehensive, and cooperative (3C) multimodal transportation planning process. This 3C process ensures that resources are used in the most effective manner

[1] https://www.transit.dot.gov/regulations-and-guidance/transportation-planning/unified-planning-work-program-upwp

possible and that there is continuity of the transportation system across jurisdictions.

MPOs do not own nor operate transportation systems, but rather serve to coordinate and build consensus in the planning and programming of funds for transportation projects and operations. MATPB involves a variety of stakeholders into the planning process including Metro Transit, WisDOT, the airport authority, rail-freight providers, private providers of transit, and local municipalities.

Urbanized areas with populations of more than 200,000, such as the Madison region, are designated as Transportation Management Areas (TMAs). TMAs have additional planning responsibilities, including the creation of a congestion management process. Further, TMAs must include officials of public agencies that administer or operate public transportation systems within the metropolitan area on the policy board as well as appropriate state officials.[2]

Federal Regional Transportation Planning Requirements

Most major transportation projects are funded through a mix of federal, state, and local funding. Likewise, projects can have a variety of lead agencies that are responsible for planning, construction, and maintenance, including communities, counties, and states. To ensure a unified metropolitan transportation planning process, FHWA's Metropolitan Planning Program provides funding for MPOs to act as a coordinating agency. MPOs work with all stakeholders involved on projects to ensure a seamless transportation network, logical timing of project construction, and to eliminate reduncancy between communities. Agreed upon projects are added to the TIP. Projects that are not in the TIP cannot receive federal transportation funding.

MPOs are bound by a number of statutory requirements that are incorporated into transportation funding and authorization bills. For example, in 2012, the Moving Ahead for Progress in the 21st Century Act (MAP-21) was authorized. MAP-21 largely built upon the previous authorization and added requirements to use a performance-based approach to transportation decision making and the development of transportation plans.[3] To meet this requirement, MPOs create performance reports that contain targets set to correspond with plan goals.

The most recent authorization bill, the Fixing America's Surface Transportation Act (FAST), builds upon MAP-21, and adds requirements that MPOs:

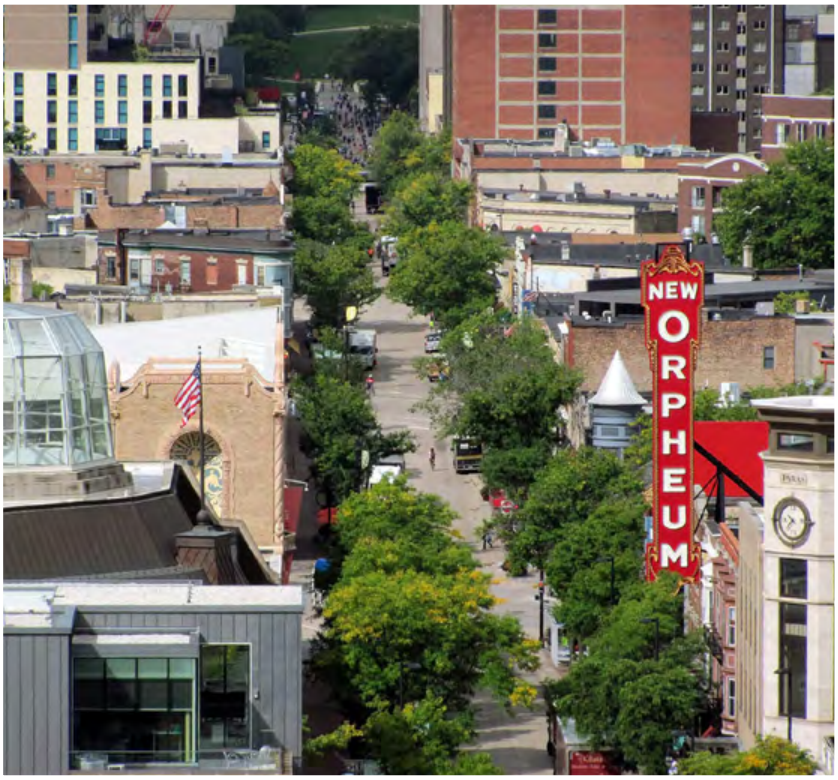
- Identify and list intercity bus providers, intercity bus routes, intercity bus facilities, and commuter van pool providers in regional transportation plans. Identify public transportation facilities and providers in regional transportation plans
- Add a representative of a transit provider to the MPO board with equal authority as other members and allow them to also represent their local community
- Consult with additional local planning officials during the planning process, including tourism and natural disaster preparedness planners
- Expand the scope of the regional transportation plan to add improving the transportation system resiliency and reliability; reducing or mitigating the storm water impacts of surface transportation, and enhancing travel and tourism
- Develop strategies to reduce the vulnerability of existing transportation infrastructure to natural disasters
- Consider the role that intercity buses may play in reducing congestion, pollution, and energy consumption in a cost-effective manner; and strategies and investments that preserve and enhance both public and privately owned and operated intercity bus systems
- Ensure that public ports and private providers of transportation, including intercity bus operators and employers with commuting programs be given reasonable opportunity to comment on the RTP

MATPB has worked to fulfill these and other requirements since the FAST Act was authorized.

[2] http://www.fhwa.dot.gov/planning/publications/briefing_book/part01.cfm
[3] http://www.fhwa.dot.gov/map21/factsheets/mp.cfm

A Performance-Based Approach

MAP-21 introduced a requirement for MPOs to take a performance-based approach to planning and programming. This performance-based approach will produce measurable outcomes that can influence future decisions. The FAST Act continues this transition towards a performance-based, outcome-driven approach.



The U.S. Department of Transportation (USDOT) recommends the following performance-based planning and programming process:

- Strategic Direction– a vision for the future, as articulated by the public and key stakeholders:
  - Goals– an aspiration or desired result of the plan
  - Objectives – Strategies or implementation steps to attain the identified goals
  - Performance Measures – Ways to quantitatively examine and track the progress towards implementing objectives over time
- Planning Analysis – a public involvement and performance-driven review of existing and projected future conditions used to develop investment and policy priorities:
  - Identification of Trends and Targets – review of the performance data to find the general direction of measures and setting of desired levels of performance to be achieved within a certain time frame
  - Identification of Strategies and Analysis of Alternatives – development of scenarios with packages of policies and/or projects that could be used to reach identified performance targets or explore the types of funding that would be required to achieve a certain level of performance
  - Development of Investment Priorities – selection of the scenario that supports attainment of the targets, considering trade-offs between different goal areas as well as policy priorities
- Programming – Selecting specific investments to include in the transportation improvement program or TIP:
  - Development of Investment Plan – an optional mid-range (10-year) plan that links the TIP to the RTP
  - Allocation of Resources / Programming Projects – TIP project prioritization based upon the basis of performance with a demonstrated clear link to meeting performance objectives
- Evaluation of Implementation – Ongoing review of success and failures:
  - Monitoring – gathering information on actual conditions
  - Evaluation – analysis to understand the extend implemented strategies have been effective
  - Reporting – communicating information about system performance and effectiveness of plans and programs to policymakers, stakeholders, and the public

MATPB completed the first Performance Measures Report for the Madison area in 2016. The results of the report informed the recommendations in the RTP and will also inform projects selected for inclusion in the TIP.

Performance-Based Planning and Programming Framework

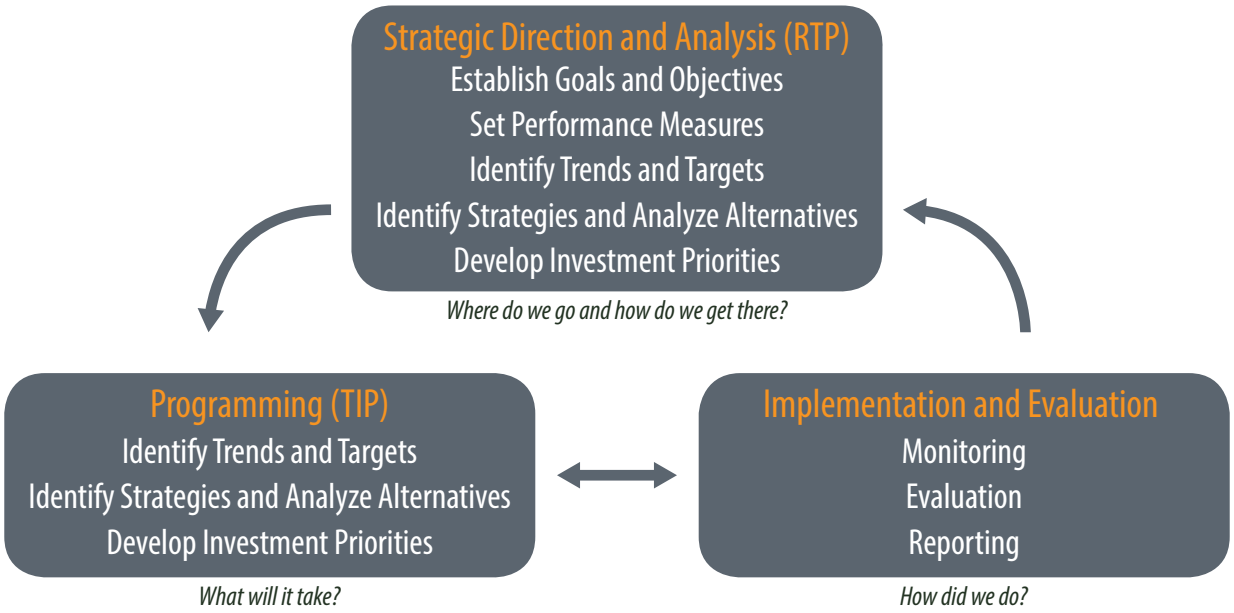
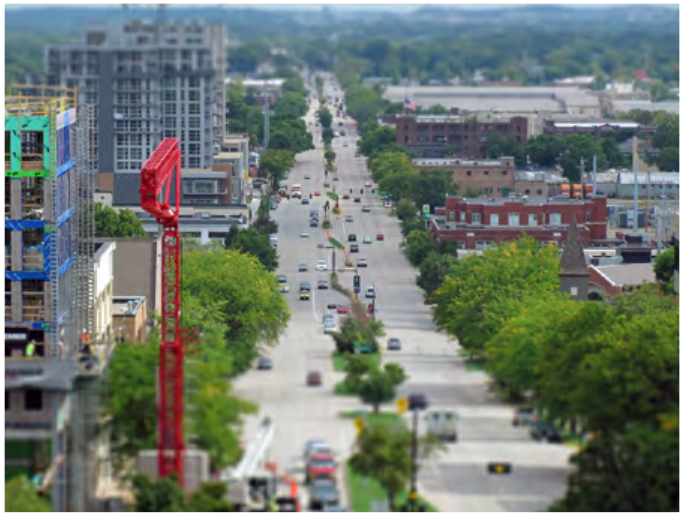


Figure 1-4: Performance-Based Planning and Programming Framework

THE PLANNING PROCESS

What is the Regional Transportation Plan?

The RTP is an integrated, multi-modal plan that articulates how the region intends to manage and operate its multi-modal transportation system (including transit, highway, bicycle, pedestrian, and other modes) to meet the region's economic, transportation, development, and sustainability goals. The RTP defines the transportation goals for the region and specifies the policies, projects, and strategies that will achieve these goals. Additionally, the plan ties goals to performance measures and sets performance goals to track the region's progress in meeting plan goals. Further, a board-approved and FHWA-accepted RTP is required for a metropolitan area to be eligible to receive federal funding for transportation projects.



The RTP acts as a transportation investment guide that MATPB, local jurisdictions, and the Wisconsin Department of Transportation (WisDOT) use to ensure a unified regional transportation network. As a "fiscally constrained " plan, the RTP must demonstrate that the projects listed in the plan can be implemented using committed, available, or reasonably available revenue sources. The RTP must be updated every five years and cover a minimum of 20 years.

The RTP is based upon and designed to support CARPC's regional land use policy plan and local comprehensive plans for growth and development.

Plan Development Process

The RTP was developed using a process that can be broken down into various steps including:

- Establish a regional vision and goals by engaging the public and stakeholder groups in a robust involvement process
- Perform an existing conditions analysis in which trends related to demographics, the economy, land use development, travel, and transportation system performance are examined and their relationship to plan goals and performance measures established
- Develop population and employment forecasts for the planning period
- Analyze the existing conditions in combination with forecasts to develop improvement strategies and projects and determine the capital requirements, operational strategies, and land use policy changes that may be needed in combination with these strategies and projects
- Evaluate and prioritize the strategies and projects in order to ensure consistency with plan goals and make progress towards performance targets

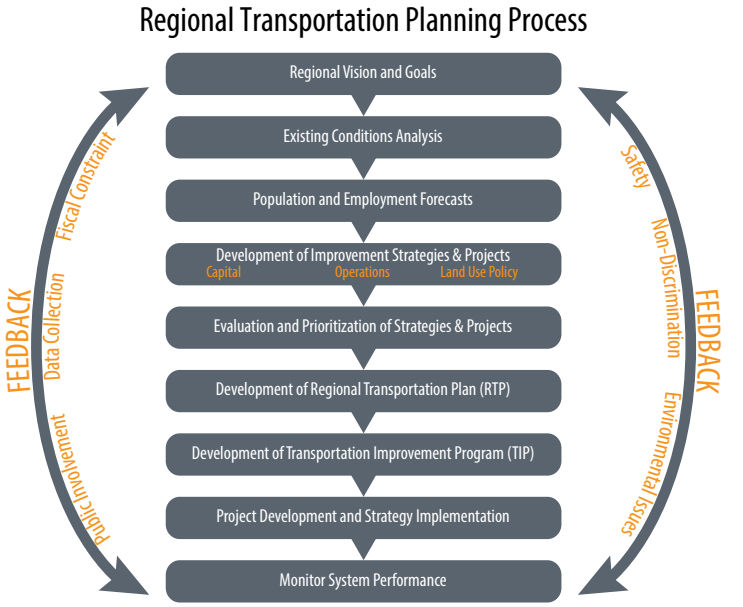


Figure 1-5: Regional Transportation Planning Process

Additionally, while preparing the RTP the following National Planning Factors guided the planning process:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency
- Increase the safety of the transportation system for motorized and non-motorized users
- Increase the security of the transportation system for motorized and non-motorized users
- Increase accessibility and mobility for people and freight
- Protect and enhance the environment, promote energy conservation, and improve the quality of life for the community
- Promote consistency between transportation improvements and planned State and local growth and economic development patterns
- Enhance the integration and connectivity of the transportation system for all modes
- Promote efficient system management and operation
- Emphasize the preservation of the existing transportation system
- Enhance travel and tourism
- Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of transportation

Once these steps were completed, a financial capacity analysis was performed to ensure that any recommendations made in the RTP could be completed between now and 2050 using cost and revenue estimates. The draft RTP was then submitted to MATPB policy board for adoption.

MATPB adoption of the RTP demonstrates regional agreement upon the transportation vision for the metropolitan area. Upon adoption, the RTP implementation and performance measurement begin. Implementation can include building new facilities, adding transit service, implementing traffic and transit operational improvements, adding new trails, adopting policies, and completing further studies to refine improvements or strategies recommended in the plan.

Plan Development Timeline

The development of the RTP took place along a timeline that began in the fall of 2015 and concluded in the spring of 2017, with a public engagement process taking place concurrently. While many engagement activities were timed with plan development steps, others, such as social media and website updates and committee meetings, occurred throughout the planning process.

In the fall and winter of 2015, MPO staff began to collect data, analyze existing conditions, and prepare growth forecasts. While this was occurring, MATPB partnered with CARPC and the City of Madison to conduct the Madison Area Regional Values and Priorities survey in an effort to learn more about the values and concerns area residents.

Early 2016 was spent developing goals and policy objectives based on feedback from the first series of public information meetings that were held during that same time period. The RTP online engagement tools were also launched at this time.

During the summer and fall of 2016, MATPB staff used information obtained from community involvement activities (such as the earlier public meetings and survey tools), committee meetings, and information gathered previously in the planning process to develop improvement projects and strategies. At this time, the RTP began to be drafted.

In the fall and winter of 2016, the second series of public engagement activities took place. The meetings sought feedback on the improvement projects and strategies that MPO staff developed, as well as suggestions for additional projects. Feedback from these activities helped to inform the prioritization of projects and strategies that took place during this time. During the same time period, the MPO launched the online transportation budgeting tool to learn more about how area residents would like to see their transportation dollars spent.

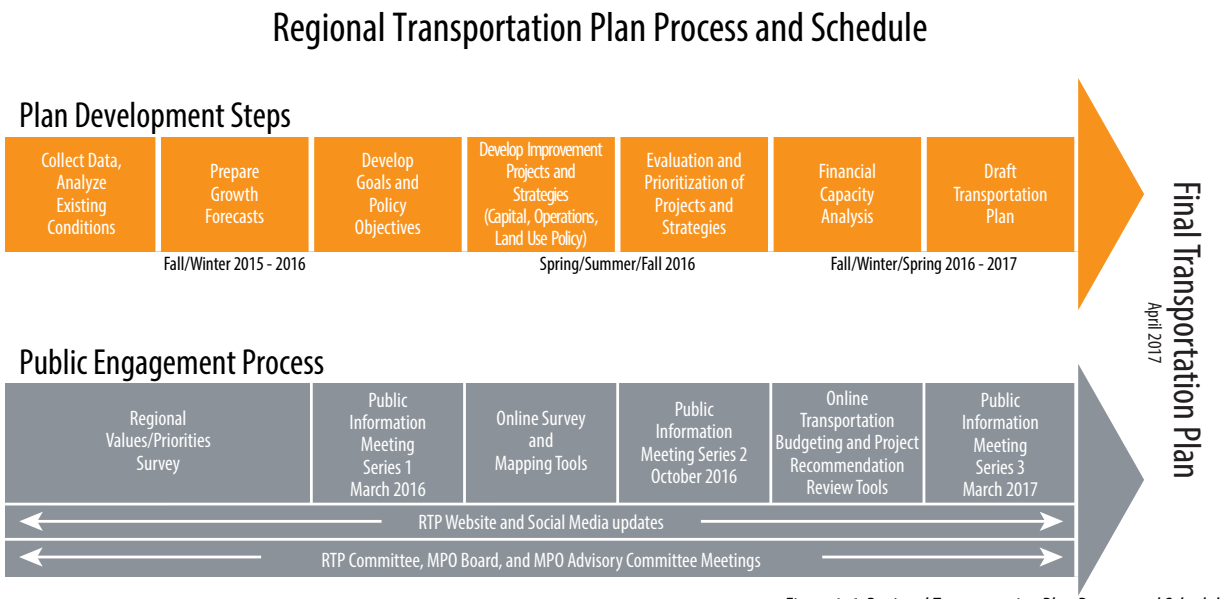


Figure 1-6: Regional Transportation Plan Process and Schedule

In the winter 2016 through the spring of 2017, staff completed a financial capacity analysis. This analysis determined which projects and strategies from the prioritized list would be included in the plan based on available funding. Once prioritized, the draft RTP was completed. During this same period environmental justice and environmental analyses of the draft RTP were completed to evaluate the impacts of the RTP on minority, low-income, and autoless households, and screen major projects for potential environmental impacts. The draft RTP was then presented at a public meeting, RTP Advisory Committee/TCC/CAC meetings, and the MPO board. Feedback from these meetings was incorporated into the final draft RTP, which was, in turn, approved by the MPO board on April 5, 2017.

RELATIONSHIP TO OTHER PLANS AND STUDIES

Transportation planning is a continuous process. The RTP builds upon a number of other planning efforts, studies, reports, and programmed transportation projects. Where applicable, the RTP has incorporated recommendations and policies from current plans including (but not limited to):

MPO Plans and Studies

2035 Regional Transportation Plan Update (2012)



MATPB's previous RTP. The 2035 RTP Update was a minor update to the RTP 2030 (2006) to account for new and modified land use plans, growth and development, new household, employment and traffic forecasts, and other changes and trends affecting the system since the RTP 2030 was adopted. As with all RTPs, it is an integrated, multi-modal system plan that provides the overall framework for transportation planning and investment decision making in the region. It identifies transportation projects and strategies or actions to be implemented.

Bicycle Transportation Plan (2015)

The Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County is a comprehensive bicycle plan to serve as a blueprint for continuing to improve bicycling conditions and increase bicycling levels throughout Dane County. The planning horizon is 2050. It provides a framework for cooperation between state agencies, Dane County, and local governments in planning for and developing bicycle facilities and programs. It is intended to educate citizens and policy makers on bicycle transportation issues and the needs of bicyclists as well as present resources for planning, designing, and maintaining bicycle facilities. The plan is a component of MATPB's RTP.

Madison Area Bus Rapid Transit Study (2013)

This feasibility study investigated how Bus Rapid Transit (BRT) might be used in the Madison Area. This study investigated four corridors radiating from Central Madison – west, south, east, and north – connected by a central spine through the Isthmus. BRT is a fast, frequent, high-capacity, limited-stop transit service that offers an improved rider experience on busy travel corridors. It offers many similar advantages to rail transit. The study identified a proposed system, provided cost and ridership estimates, and identified next steps for potential implementation of BRT.

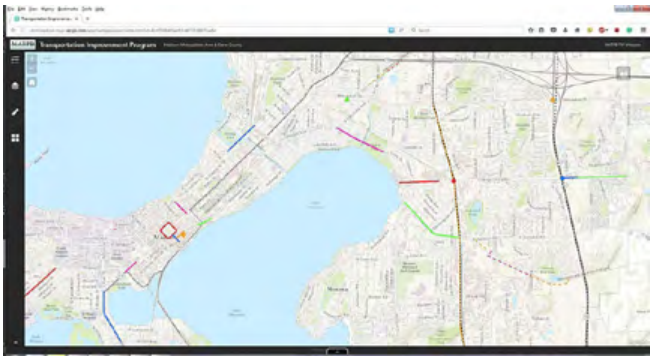
2017-2021 Transportation Improvement Program (2016)

The Transportation Improvement Program (TIP), which MATPB updates annually, is a coordinated listing of short-range transportation improvement projects anticipated to be undertaken in the next five-year period. The TIP is the mechanism by which the long-range RTP is implemented, and represents the transportation improvement priorities of the region.

Projects within MATPB Planning Area must be included in the TIP in order to be eligible to receive federal funding assistance. Outer county area projects are also listed for information and coordination purposes. The list is multi-modal. In addition to streets/roadways, it includes transit, pedestrian, bicycle, parking, and rideshare/transportation demand management projects.

The coordinated listing of projects in the TIP is a cooperative effort by state and local implementing agencies and the staff of MATPB, and is primarily based upon capital improvement programs and budgets. Implementing agencies submit their lists of proposed projects to MATPB staff to coordinate into a comprehensive list of proposed transportation improvements, with information about project scope, cost timing, etc. The listing is subject to review by local units of government, MATPB Technical Coordinating Committee (TCC), and MATPB. Opportunities are also provided for public involvement and comments.

The TIP is not a final schedule of project implementation. The time frame shown in the TIP is a "best estimate." The timing of projects can change due to delays in project development activities, changes in implementation priorities, and other factors. Annual updates to the TIP allow for these adjustments to project schedules and changing transportation improvement priorities. In addition, the TIP may be amended after it is adopted in order to add or delete projects, change project timing, or accommodate cost, phasing, or scope changes to a project. These amendments are usually minor. If a major change were to be adopted, an opportunity for formal review and comment would be provided.



An image from the Transportation Improvement Program interactive website. Click on the image to view the website.

MATPB Performance Measures Report (2016)

The Performance Measures Report measures progress towards regional transportation goals, identified in the RTP, using data from a variety of sources. The report, which is released annually, is used along with the TIP and RTP in the new performance-based planning process.



Cover of MATPB Performance Measures Report. Click on the image to view the report.

2013-2017 Transit Development Plan (2013)

The Transit Development Plan (TDP) for the Madison Urban Area is a short- to medium-range strategic plan intended to identify transit needs and proposed improvements and studies over a five-year planning horizon. MATPB is responsible for developing and maintaining the TDP. MATPB works in close cooperation with Metro Transit and other transit providers, funding partners, and jurisdictions in the Madison area to develop the plan. The TDP is developed within the overall framework of the long-range RTP.

Congestion Management Process (2011)

Metropolitan Planning Organizations with planning area populations over 200,000 are designated as Transportation Management Areas (TMA) by FHWA. In these areas, a Congestion Management Process (CMP) must be developed and implemented as a part of the metropolitan planning process. The CMP is an 8-step process:

- Develop Congestion Management Objectives;
- Identify Area of Application;
- Define System or Network of Interest;
- Develop Performance Measures;
- Institute System Performance Monitoring Plan;
- Identify and Evaluate Strategies;
- Implement Selected Strategies and Manage Transportation System; and
- Monitor Strategy Effectiveness.

MATPB developed its first CMP in 2011 based on a cooperatively developed and implemented metropolitan-wide strategy that provides for the safe and effective management and operation of the transportation system. Strategies from the CMP are incorporated into the RTP and TIP. Strategies used to manage travel demand, reduce single occupant vehicle (SOV) travel, and improve transportation system management and operations are all to be considered, as well as those that explicitly address bicycling and walking.

Madison Metro Transit Bus Size Study (2014)

The Bus Size Study contains a detailed analysis of Metro Transit bus routes to determine the suitability of larger or smaller vehicles for different routes on the system. The study includes supplemental analysis on the introduction of larger or smaller buses into the fleet, including the financial implications of such a move, an analysis of whether or not existing bus maintenance facilities and stops can accommodate larger buses, and the effects larger buses would have on vehicle scheduling and operations.

WisDOT Plans and Studies

Connections 2030 (2009)

Connections 2030 is WisDOT's long-range transportation plan for the state of Wisconsin. This plan addresses all forms of transportation over a 20-year planning horizon: highways, local roads, air, water, rail, bicycle, pedestrian, and transit. The plan outlines priority projects and studies within the metropolitan planning area.

Wisconsin State Freight Plan (2017)

The State Freight Plan is WisDOT's first attempt at articulating a statewide vision for multimodal freight transportation. The plan includes five key elements: linking transportation investments to economic development activities, placing Wisconsin within a national and global context, engaging and reflecting the interests of a wide array of freight stakeholders, implementation - from planning to project development and programming, and performance measures and management. Local freight routes were ranked as part of the planning process.

Madison Beltline Study (ongoing)

The Madison Beltline Study is a three part study process that will focus on improving safety and mobility for all modes of travel while reducing congestion and limiting social, cultural, and environmental impacts. An origin-destination study was completed in 2012. WisDOT began a planning and environmental linkages (PEL) study for the corridor in 2013. A National Environmental Policy Act (NEPA) study will follow the completion of the PEL Study.

U.S. Highway (US) 51 Stoughton Road Corridor Study (ongoing)

This study is evaluating long-term alternatives to address the safety, congestion, and gaps in the bicycle and pedestrian facility network along this corridor. This study will follow a phased implementation approach that will identify sections of the corridor for construction and potential timing. Interim improvements may be needed for sections of the corridor in subsequent phases in order to meet the project purpose and need until construction of those phases can occur.

US 51 Corridor (Stoughton – McFarland) Study (ongoing)

This study is evaluating alternatives that will improve safety and congestion along the corridor, and address needs of bicyclists and pedestrians. Improvements in the corridor are being addressed in an environmental assessment (EA) to identify near-term improvements. A Tier 1 environmental impact statement (EIS) to analyze long-term improvements was suspended because of the unlikelihood of funding being available in the near future for a major capacity expansion project. The US 51 study corridor is an important regional and commuter route and serves as an important link to the Madison area and beyond.

US 12 Freeway Conversion Study (ongoing)

This corridor study examines a 6.1 mile stretch of US 12 in the northwestern portion of the MPO planning area. The route is part of Wisconsin's National Highway System and provides a parallel route from the Madison metro area to I-39/90/94. The study aims to develop an alternative that will increase highway functionality and safety along corridor. Dane County's North Mendota

Parkway Study intends to tie into US 12 for the western terminus. The environmental documentation is on schedule to be completed in the Summer of 2017. WisDOT intends to initiate a final official mapping of this corridor phase in 2018.

US 18/151 Freeway Conversion Study (ongoing)

This study examines a 28-miles portion of US 18/151 in portions of Iowa and Dane counties, from Dodgeville to Verona, to develop a long-term plan for freeway conversion. This study will result in the eventual removal of all direct local road and driveway access onto US 18/151. Originally completed in 2014, an official re-evaluation of the environmental document is currently underway, focusing on the Barneveld area, which will be followed by the adoption of the official map.

I-39 & US 12/18 Madison Beltline Interchange (BIC) Study (ongoing)

The purpose of this project is to improve the overall safety of the interchange by improving its geometrics, providing additional capacity to accommodate increased future traffic volumes, and enhance connectivity with the regional transportation network in the area. The Beltline Interchange was included in the 2010 finding of no significant impact (FONSI) for the I-39/90 expansion project, however due to expanded study limits and unique natural and cultural resources an environmental impact statement is currently being prepared for the interchange.

WIS 19 Safety and Operations Study (2016)

WIS 19 is an important regional route serving the northern metropolitan area of Madison, functioning as a connector to the I-39/90/94, US 151, and US 12 corridors. The study analyzed safety and operational issues, including access, to produce a corridor management plan that identifies corridor deficiencies, in addition to improvement recommendations, to extend the highway's useful life.

WisDOT Southwest Region Park-and-Ride System Study (2015)

WisDOT Southwest Region initiated the Southwest Region Park-and-Ride System Study to provide more efficient and sustainable commuting choices and reduce traffic volumes on the state highway system by locating park-and-rides at optimal locations. The first step in the location selection process is identifying areas where park-and-ride lots may be practical, with potential to attract users and meet WisDOT's park-and-ride program goals. The purpose of this report is to present the screening methodology for assessing the most efficient locations for future park-and-ride facilities in the sixteen county study area of the Southwest Region.

Local Plans and Studies

CARPC Future Urban Development Area (FUDA) Plans

FUDA is a collaborative, locally-driven effort among neighboring jurisdictions and the Capital Area Regional Planning Commission. The purpose is to protect vital natural resources, promote efficient development, and preserve farmland through cooperative planning for long-term growth. FUDA provides additional resources that local communities may use to update their comprehensive plans.

Madison in Motion – Sustainable Madison Transportation Master Plan (2017)

Madison in Motion, the City of Madison's Sustainable Madison Transportation Master Plan, will guide future transportation decisions in Madison, in order to help make Madison a more walkable, bikeable, and transit-oriented city. Madison in Motion will build on adopted transportation and land use plans to improve coordination, connectivity, and transportation choice while establishing a framework to strengthen neighborhoods with context-appropriate future development.

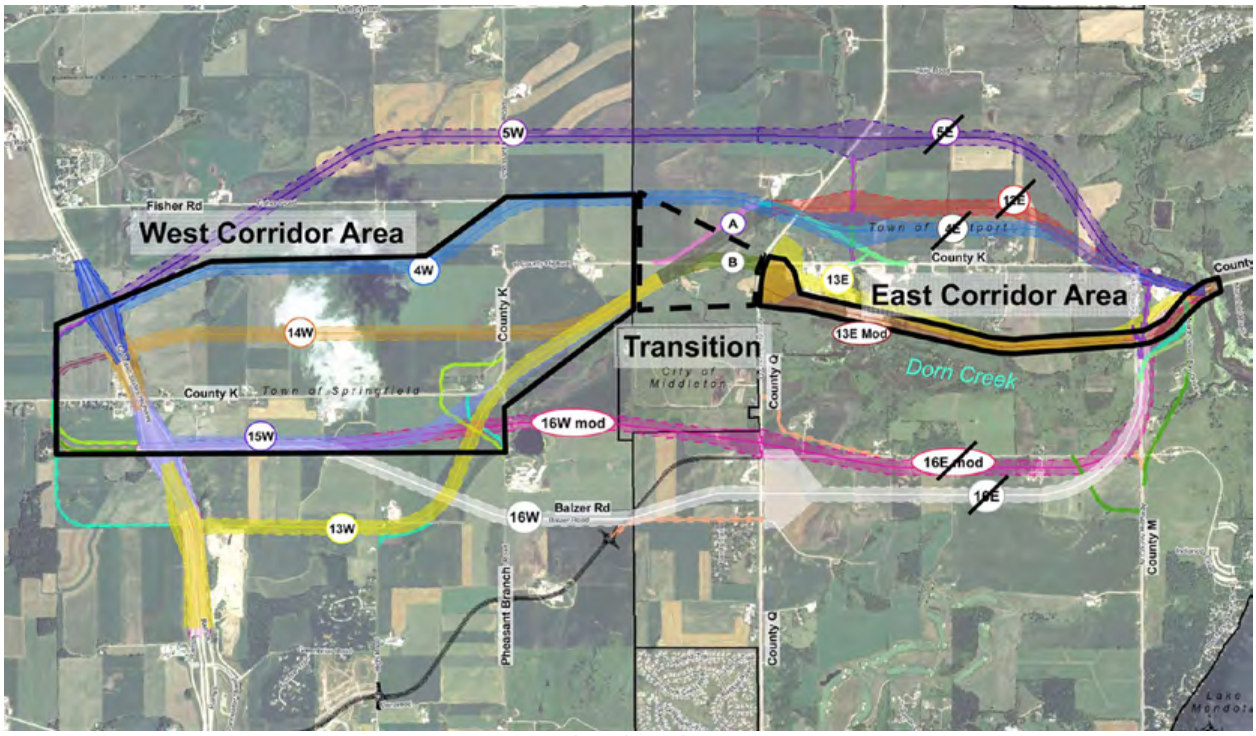


Dane County's North Mendota Parkway Study (2009)

The North Mendota Parkway Study developed a series of recommended study areas for a future north-metro parkway route:

- An eastern corridor area between County Highway M and County Highway Q;
- A broader western corridor area between the Town of Westport / Town of Springfield line and U.S. Highway 12, and;
- A transition area to connect the eastern corridor and western corridor areas.

Additionally, the study recommended a natural resource area boundary to protect the environmental, water, scenic, and recreation resources in the North Mendota area. The plan was adopted and incorporated into the Dane County Parks and Open Space Plan; however, capital funds have not yet been identified to construct this route.



North Mendota Parkway

STAKEHOLDER INVOLVEMENT AND PUBLIC OUTREACH

The intent of the RTP is to offer a vision and blueprint for the future of the transportation network in the Madison area. To develop this vision and find consensus between completing interests, it is important to have a robust dialogue between the community, stakeholders, and local officials. MATPB staff worked to facilitate opportunities for all interested parties to participate in the planning process and attempted to make that process more inclusive for those that may not feel comfortable or have the time for traditional forms of participation.

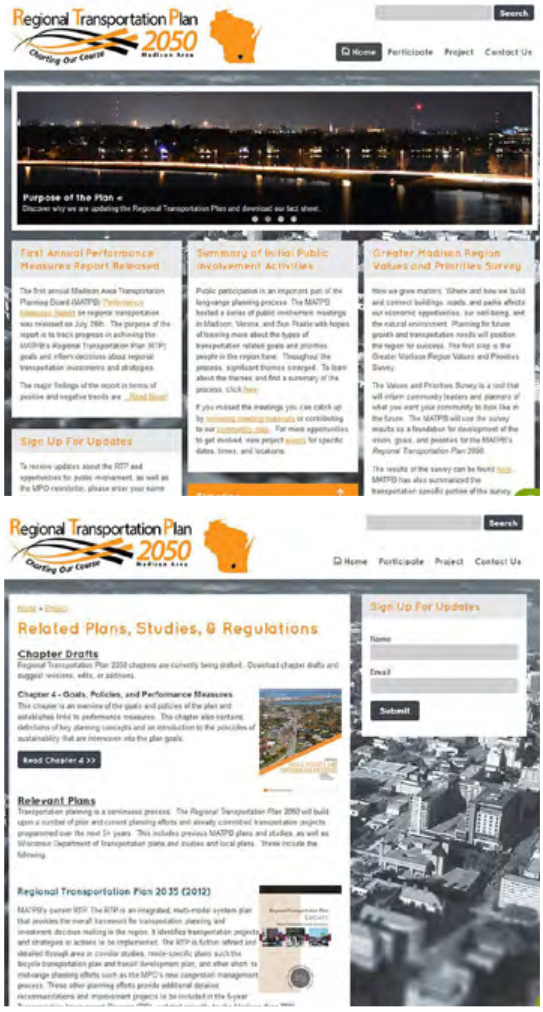
The public involvement process for RTP 2050 included:

- An interactive public participation website
- A RTP advisory committee made up of local elected officials and community leaders
- A community values and priorities survey
- Three series of three public involvement meetings
- MATPB newsletter updates

Specific materials delivered during the involvement process can be found in Appendix I.

Public Participation Website

At the start of the planning process, MATPB worked with a consultant to create an interactive website for the RTP in an effort to increase public participation and interest in the planning process. The website, MadisonAreaRTP.com, provided project news, descriptions of the plan development process, a listing of RTP related boards and committees and corresponding membership, a timeline of public engagement activities and meetings, links to related plans and studies, information about MATPB, and interactive tools at specific points in the planning process.



Images of the RTP 2050 website.

RTP Committee

An ad hoc RTP Advisory Committee was created to help guide development of the plan. The committee consisted of primarily elected officials, citizen members of local transportation related committees, and others representing important stakeholders and constituencies in the region. Membership included:

- Stephen Flottmeyer – Planning Chief, WisDOT SW Region & MPO Policy Board Member
- Jennifer Sarnecki – Statewide Planning Chief, WisDOT
- Chuck Kamp – General Manager, Metro Transit & MPO Policy Board Member
- Paul Esser - Mayor, City of Sun Prairie
- Hans Hilbert - Alder, City of Middleton, District 7 & Chair of the Ped/Bike/Transit Committee
- Elizabeth Doyle - Alder, City of Verona, District 1 & Council President
- Kim Lobdell - Chair, City of Fitchburg Transportation & Transit Committee
- Carl Chenoweth - Dane County Supervisor, District 35 & Member, Commission on Economic and Workforce Development
- Rod Clark, Member – Village of McFarland, Finance &Ad Hoc Transportation Needs Committees
- Kevin Little – Managing Director of Economic Development, Greater Madison Chamber of Commerce
- Amanda Larson – YW Transit Program Coordinator, YWCA Madison
- Dave Porterfield – Real Estate Developer, Movin' Out, Inc.
- Jessie Lerner – Executive Director, Sustain Dane
- Ken Golden – Member of CARPC, Member of City of Madison Transit & Parking Commission, Member of MPO Policy Board
- Betty Hicks – Member, City of Madison Disability Rights Commissions and ADA Transit Subcommittee
- Tom Wilson - Attorney/Administrator/Clerk - Treasurer, Town of Westport
- Chad Lawler - Director of Government Relations & Advocacy - Madison Area Builders Association
- Susan Schmitz - President - Downtown Madison, Inc.

The committee helped identify important issues facing the regional transportation system and how those issues impact their constituencies. Additionally, the committee provided feedback on plan goals and policies, public outreach strategies, project recommendations, and chapter drafts.

Community Values and Priorities Survey

MATPB partnered with the Capital Area Regional Planning Commission (CARPC) to conduct the Priorities and Values Survey of the greater Madison region, with the support of the consulting firm Heart+Mind Strategies. The scientific survey of 457 residents was conducted December 8-22, 2015. Midway through the scientific study, an open survey was conducted, garnering 1,179 responses, primarily from the Madison urban area. The purpose of the survey was to determine regional priorities, values, and motivations that could be used to guide the planning process in the area. The survey asked general questions about the region, as well as transportation-specific questions.

The key findings of the survey were as follows:

1. Madison region residents enjoy a high quality of life and have a relatively positive outlook – well above the national average. However, residents believe that the local economic recovery has been sluggish.
2. While growth is viewed as inevitable, most believe it brings benefits and should be encouraged.
3. Education (K-12 and Higher) and agriculture are seen as the top regional equities. Jobs, income inequality, affordable housing, crime, and access to healthcare are top regional challenges.
4. Financial wellbeing, personal security, and a sense of community are the dominant personal values of residents in the region.
5. High support for regional visioning (or planning) that focuses on safe neighborhoods, affordable housing, revitalization and reinvestment to reduce crime, and improving base infrastructure.
6. Strong support for regional transportation investment, particularly increases in road maintenance, and improvement/ expansion of public transportation.

Specific to transportation, the survey asked participants if they agreed with a number of growth management and transportation strategies. Some of the most popular strategies included "Improving Neighborhood Walking and Biking Safety/ Convenience" (85% favorable), "Improving Base Infrastructure" (79% favorable), and "Investing in High Poverty/Crime Areas" and "Revitalizing Old Neighborhoods" (both 77% favorable).

Participants were also asked if having a long-range regional transportation plan was important, with 67% saying that it was "Extremely Important" or "Very Important." Though participants viewed planning to be important, only 33% believed that the planning and implementation of transportation solutions was going "Good" or "Excellent."

Participants were then asked about what they felt the appropriate level of investment was for a variety of transportation projects across all modes. Overall, participants desired increased investment in road maintenance, new and expanded highways, and new and expanded transit service.

When asked about the top transportation priorities, participants said that using the latest transportation technology, locating



Values and Priorities Survey presentation at the Madison Public Library - Central Library on Feburary 16th, 2016. Photo credit: CARPC.

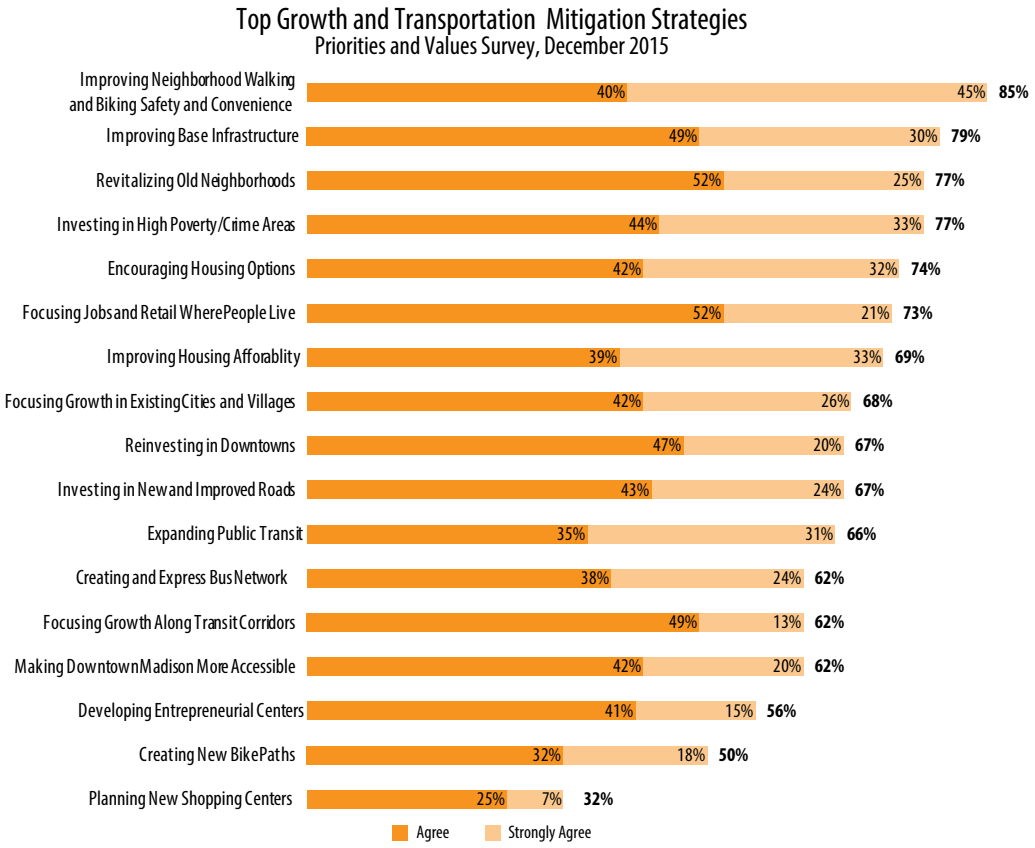


Figure 1-7: Top Growth and Transportation Mitigation Strategies

attractions near transit, ensuring that the transportation network supports the regional economy, improving roadway maintenance, and expanding public transit ranked highly. Interestingly, the lowest rated priority was improving biking and walking infrastructure.

When asked about the performance of specific aspects of the transportation system, participants responded that biking and walking infrastructure, roadway maintenance, locating attractions near transit, and roadway capacity were performing well. The lowest rated included "high-capacity transit" and "incentives for driving alternatives," the former is unsurprising because the region does not currently have high-capacity transit service. There is a correlation between the priorities and perceived network performance, with some high performers not being high priorities, such as biking and walking infrastructure.

Finally, participants were asked if they supported use of local taxes to fund transit operations and improvements. Overwhelmingly, the region's residents support funding transit with local taxes. Residents were not specifically asked about support for a new local funding option, such as a Regional Transit Authority with ability to levy a sales tax.

Results from the survey were used to refine the RTP goals and policies, and to inform RTP recommendations.

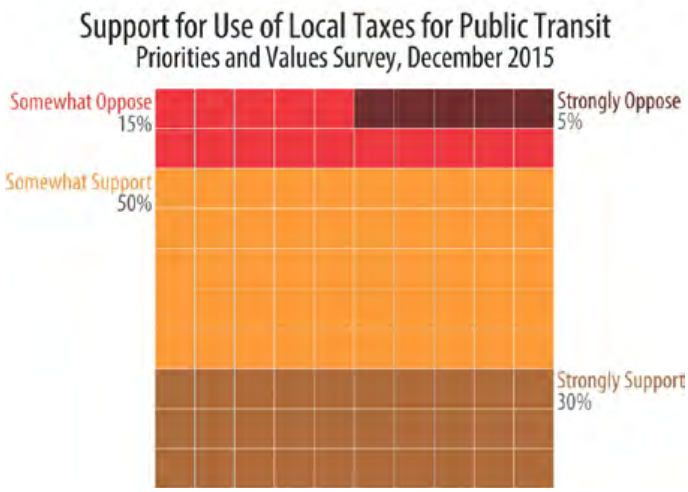


Figure 1-8: Support for Use of Local Taxes for Public Transit

Public Involvement Meetings

Locations and Context

MATPB made a priority of engaging the public in the planning process, engaging people at nine outreach meetings during the three phases of the project:

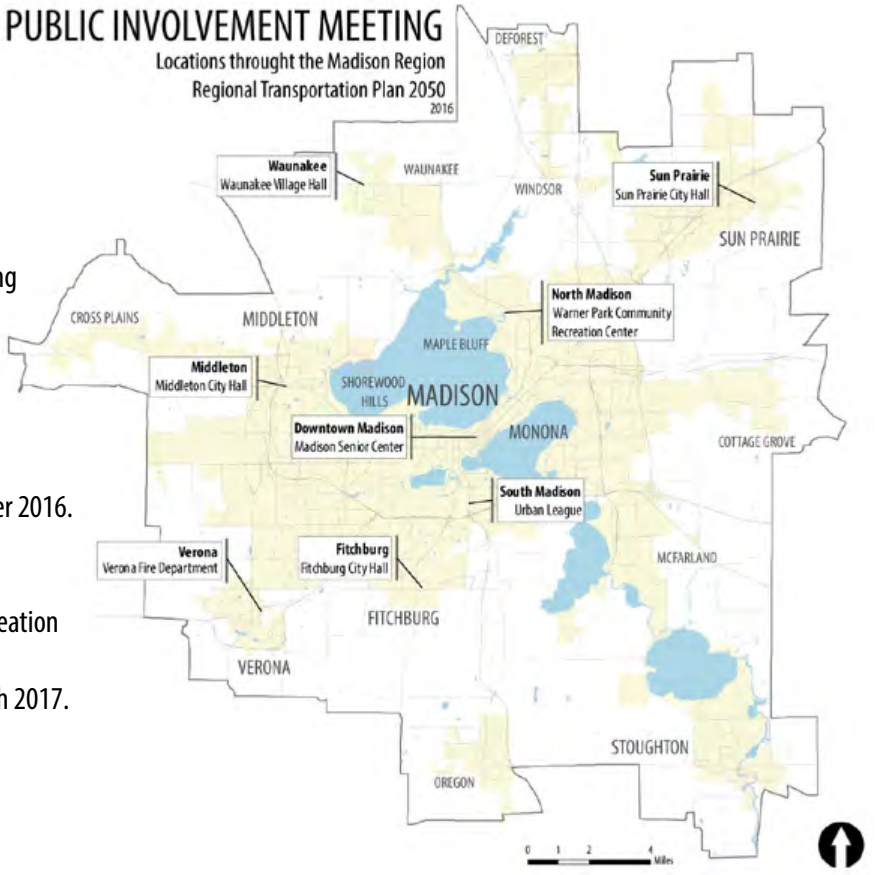


Figure 1-9: Public Involvement Meeting Locations

Series One: Introduction to the Planning Process and Goal Setting. March 2016.

- the Urban League of Greater Madison,
- City of Verona Fire Department
- the Sun Prairie City Hall.

Series Two: Existing Conditions. October 2016.

- the Fitchburg City Hall,
- the Middleton City Hall, and
- the Warner Park Community Recreation Center in Madison.

Series Three: Recommendations. March 2017.

- the Madison Senior Center,
- the Waunakee Village Hall, and
- the Sun Prairie City Hall.

In addition to the involvement meetings, MATPB held a public hearing on the draft RTP 2050 during its March 1 board meeting in Madison.

Meeting Feedback

After each series of public involvement meetings, MATPB staff summarized the key takeaways and sentiments from the events. They are as follows:

Series One

- Transportation Funding– Strong support for Regional Transportation/Transit Authorities (RTAs) and alternative transportation funding mechanisms. An RTA would allow for truly regional transit service and allow for local service in suburban communities. If an RTA is not feasible, a use-based fee/tax could allow for funding of local projects and encourage more local control over the transportation network. Funding must be sustainable.
- The Economy – The link between transportation and the economy should be emphasized. There is a need for improved facilities/services providing connections



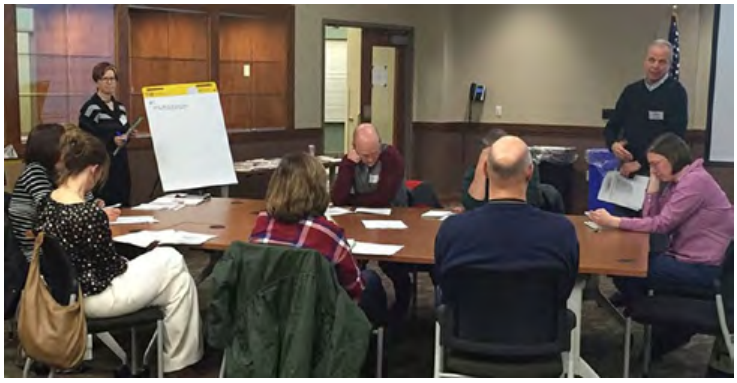
South Madison Public Involvement Meeting at the Urban League of Greater Madison on March 2, 2016.

between housing and jobs/destinations, particularly in areas outside of the central city.

- Equity – The equity goal should be more inclusive than currently defined.
- Mode Choice & Connectivity – Regardless of location, citizens should have the ability to choose between a variety of transportation options with the ability to live a "car-free" lifestyle, if desired. We should work to retrofit existing roads with bicycle and pedestrian facilities.
- Land Use – The transportation network should support efficient, compact land use patterns. Land use patterns that support transit should be encouraged. Where applicable, encourage retrofitting streets in areas of higher density and mixed-use development to support public transportation.
- Transit – Regional transit and local transit for suburban communities is desired. There is a strong desire to increase transit service frequency, capacity, and service area. Paratransit service areas should be expanded. Transit between suburban communities should be supported as well. Suburban communities should explore alternative forms of transportation – shared ride taxis, car sharing, and new technologies as they become available.
- Health & Safety – The definition of health in the plan goals should be expanded to include "improve access to healthy food." The links between health and safety should be strengthened.
- Technology – The transportation network should adapt to new technologies as they become available. Regionally, we must be aware of new technologies, such as autonomous transit, that could solve issues that are on the horizon, such as baby boomers' desire to age in place.
- MATPB will use the feedback from the meetings to inform plan development and to revise goals. New plan goals will be posted once they are available.



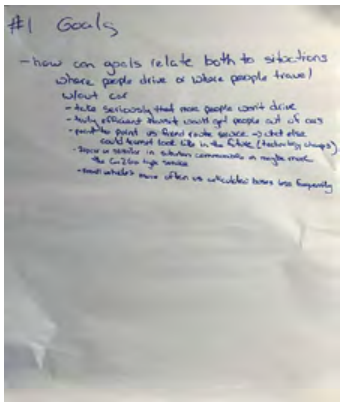
Presentation at the South Madison public involvement meeting on March 2, 2016.



Group discussion at the Verona public involvement meeting held at the Verona Fire Department on March 3, 2016.



Sun Prairie public involvement meeting held at City Hall on March 8, 2016.



Participants helped to determine plan goals at the first series of public involvement meetings.



Involvement meeting at Warner Park in October 2016.



Inolvement meeting in Middleon in October 2016.



Involvement meeting in Fitchburg in October 2016.



Involvement meeting in Fitchburg in October 2016.

Series Two

The second series of engagement meetings focused on reviewing the existing and potential future transportation network. Attendees also had the opportunity to review a presentation that outlined the planning process and reviewed feedback from series one. Finally, attendees were given the opportunity to critique project recommendations and identify needs by providing feedback via a table activity.

Series Three and Public Hearing

The final series of engagement meetings involved presenting the draft plan and presentation boards to meeting attendees. Much like series two, attendees were given the opportunity to critique needs and recommendations identified in the plan, as well as give feedback about specific projects.

Major ideas and issues discovered in the public engagement sessions were incorporated into the RTP as appropriate.

MPO Newsletters

MPO staff prepared newsletters briefing the public on general MATPB happenings as well as RTP-specific news, updates, and results. Newsletters provided links to draft chapters, the RTP website, and RTP apps.



Moving the Region

Newsletter of the Madison Area Transportation Planning Board

March 2017

ARTICLES

- Draft Regional Transportation Plan Now Available
- WisDOT Cancels I-39/90/94 Study
- Park Street Corridor Connected Vehicle Pilot Project
- New Staff at MATPB

Stay in the know..... Like Us on Facebook

In Case You Missed It...

In 2015-16, Dane County Parks in partnership with the Madison Area Transportation Planning Board contracted with Toole Design Group to develop a county wide Bicycle Wayfinding Manual. The manual provides guidelines for communities to use for designing and implementing a uniform wayfinding and information sign system for the bicycle network throughout Dane County.

The project also included the development of six bicycle wayfinding plans for the Capital City Trail, Cannonball Path, Ice Age Junction Trail, Monona Lake Loop, University Avenue, and Military Ridge State Trail. The completed Wayfinding Manual and sample plans are now available on Dane County Parks website.

About US

Draft Regional Transportation Plan Now Available

The Madison Area Transportation Planning Board (MATPB) has completed the draft Regional Transportation Plan (RTP) 2050, culminating a planning process that began in 2015. The plan identifies transportation system needs and makes recommendations across all modes and seeks to coordinate investments of implementing agencies, including the Wisconsin Department of Transportation (WisDOT), Dane County, and local communities.

The robust planning process involved input from the public, standing boards and committees, and an ad hoc RTP Advisory Committee comprised of stakeholders from across the region. These groups helped to refine the plan throughout its development process, which included:

- Establishing a regional vision and goals;
- Examining demographic, economic, land use, and travel data, transportation system performance, and emerging technologies to identify trends that may impact the future transportation system;
- Developing population, household, and employment forecasts for the planning period;
- Analyzing the existing condition of the transportation system in combination with forecasts to develop improvement strategies, policies, and projects to address future travel demand; and
- Evaluation and prioritization of strategies and projects to ensure consistency with the regional vision and plan goals

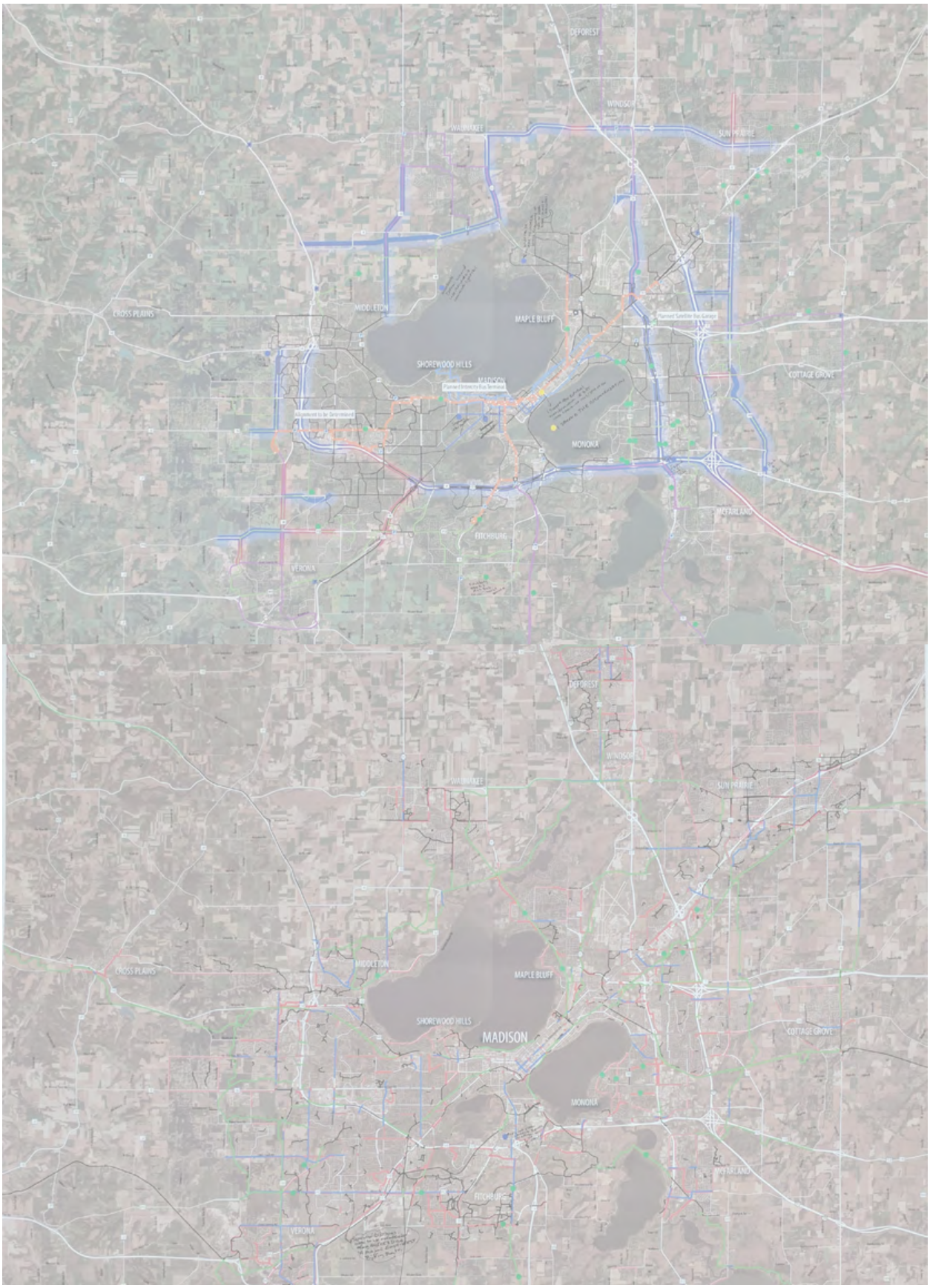
Click on the image above to view the plan.

The draft RTP is available for review on MadisonAreaRTP.com. A final series of public information meetings was just completed. Comments are requested by March 22 to ensure incorporation into the final plan. The final RTP will be available after board adoption.

WisDOT Cancels I-39/90/94 Study

In late February the Wisconsin Department of Transportation and Federal Highway Administration announced the cancellation of the I-39/90/94 Study from Madison to Portage, citing a reprioritization of major transportation projects. The study had previously identified seven possible alternatives, including widening the existing Interstate as well as four new off-alignment corridors. The termination of the study removes all of these alternatives from consideration. A new environmental study will be initiated to evaluate the replacement of the Interstate bridges over the Wisconsin River in Columbia County, which was previously included in the I-39/90/94 Study.

MATPB newsletter. Click to view newsletters on MATPB website.


DEFOREST
WINDSOR
WAUNAKEE
SUN PRAIRIE
CROSS PLAINS
MIDDLETON
MAPLE BLUFF
SHOREWOOD HILLS
MADISON
COTTAGE GROVE
MONONA
FITCHBURG
VERONA
DEFOREST
WINDSOR
WAUNAKEE
SUN PRAIRIE
CROSS PLAINS
MIDDLETON
MAPLE BLUFF
SHOREWOOD HILLS
MADISON
COTTAGE GROVE
MONONA
FITCHBURG
VERONA



CHAPTER 2:
NATIONAL & REGIONAL TRENDS AND FORECASTS

- Introduction
- Demographics
- Economics
- Land Use and Development
- Commuting Patterns
- Emerging Technologies

INTRODUCTION

National and regional trends and forecasts such as shifting demographics and growth provide insight into how best to invest in the transportation system to meet future needs while accommodating present needs. Demographic changes, commuting patterns, economic shifts, land use development patterns, and emerging technologies all influence the type, location, and amount of demand on transportation facilities and services and also pose potential equity considerations. The need to account for these changes is especially true in the greater Madison region – the fastest growing and fastest changing region in the state. The Madison area is out-pacing the rest of the state in all key economic indicators, including job creation, business growth, and construction activity.[1] The area's population growth is out-pacing the rest of the state and at the same time the population is becoming increasingly diverse.



Figure 2-1

DEMOGRAPHICS

Demographic projections have an impact on the type of solutions planned for the future transportation network. When coupled with commuting patterns, economic forecasts, and land use development patterns it is possible to prepare forecasts for future travel demand and identify issues and needs.

Population

The country's population continues to grow, with a majority of this growth occurring in the southern and western states. Wisconsin is growing at a slower pace than other states due to high out-migration without comparable in-migration of either domestic or foreign-born immigrants. However, Dane County and the City of Madison have deviated from that trend and are projected to continue to do so in the future with population continuing at a moderate rate. Dane County added nearly 100,000 new residents, while the City of Madison added nearly 41,000, between 2000 and 2015. This growth accounted for nearly ¼ of the state's growth over that time frame.

The population growth rate of Dane County as a whole outpaced the City of Madison's growth from 1990-2010 continuing a historical trend. As a result, the city's share of county population has decreased from 52.0% to 47.8%. This

Population Growth in Dane County and Madison

	Total Population			Change	
	1990	2000	2010	1990-2000	2000-2010
Dane County	367,085	426,526	488,073	16.2%	14.4%
City of Madison	190,766	208,054	233,209	9.1%	12.1%
City as % of County	52.0%	48.8%	47.8%		

Figure 2-2

Population Growth in Selected Communities

	Total Population			Change	
Community	1990	2000	2010	1990-2000	2000-2010
Cottage Grove, Village	1,131	4,059	6,192	258.9%	52.5%
Fitchburg, City	15,648	20,501	25,260	31.0%	23.2%
Madison, City	190,776	208,054	233,209	9.1%	12.1%
Madison, Town	6,442	7,005	6,279	8.7%	-10.4%
Maple Bluff, Village	1,352	1,358	1,313	0.4%	-3.3%
Middleton, City	13,785	15,770	17,442	14.4%	10.6%
Monona, City	8,637	8,018	7,533	-7.2%	-6.0%
McFarland, Village	5,232	6,416	7,808	22.6%	21.7%
Shorewood Hills, Village	1,680	1,732	1,565	3.1%	-9.6%
Stoughton, City	8,786	12,354	12,611	40.6%	2.1%
Sun Prairie, City	15,352	20,369	29,364	32.7%	44.2%
Verona, City	5,374	7,052	10,619	31.2%	50.6%
Waunakee, Village	5,897	8,995	12,097	52.5%	34.5%
Westport, Town	2,732	3,586	3,950	31.3%	10.2%

[1] Connect Madison, City of Madison Economic Development Strategy (Dec. 2016).

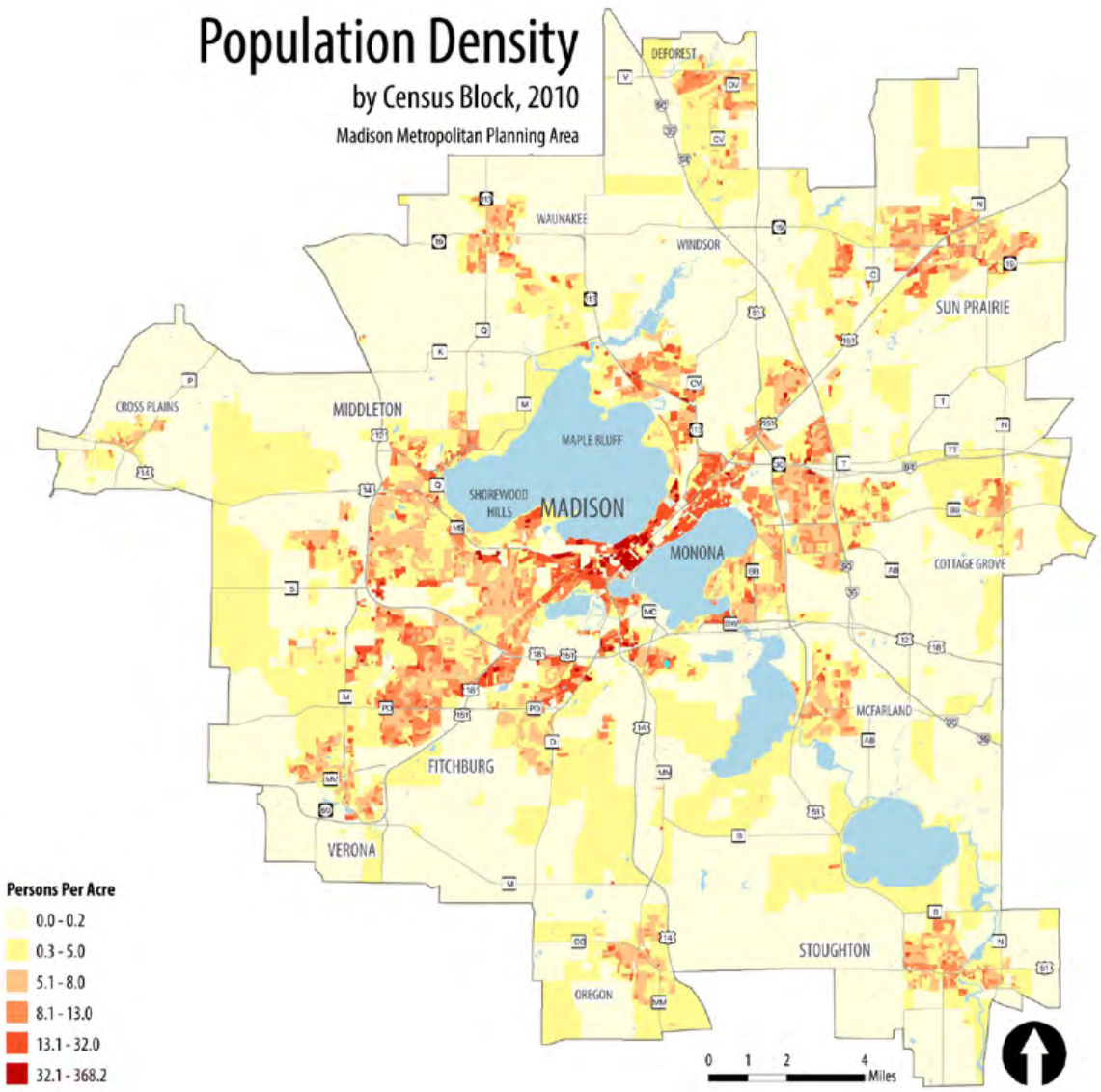


Figure 2-3: Population Density by Census Block, 2010

trend is expected to continue. Suburban cities and villages with the highest percentage growth rates over the past 25 years include Cottage Grove, Waunakee, Verona, and Sun Prairie. Paced by these communities and the DeForest/Windsor area, the larger outer urbanized areas are projected to grow by 59%, adding 55,000 new residents from 2010-2050. The population of the central urbanized area, including Madison, Fitchburg, Middleton, and McFarland, is projected to grow by 25% or 77,000 residents. The projected population growth in smaller urbanized and rural areas outside the Madison Metropolitan Planning Area is only expected to be about 17,000.

Figure 2-4

Madison Metropolitan Area Population

2010 Census and 2050 Forecast

Municipality	2010 Census Population	2010 Census % of County	2050 Forecast Population	2050 Forecast % of County	Change Number	Change Percent
Central Urbanized Area Total	302,224	62%	379,118	60%	76,894	25%
City of Madison	234,618	48%	292,522	46%	57,904	25%
City of Fitchburg	25,413	5%	34,370	5%	8,957	35%
City of Middleton	17,548	4%	24,571	4%	7,023	40%
Village of McFarland	7,855	2%	10,379	2%	2,524	32%
Larger Outer Urbanized Area Total	93,111	19%	148,375	23%	55,264	59%
City of Sun Prairie	29,364	6%	50,883	8%	21,519	73%
City of Stoughton	12,611	3%	14,366	2%	1,755	14%
City of Verona	10,619	2%	18,840	3%	8,221	77%
Village of Cottage Grove	6,192	1%	10,594	2%	4,402	71%
Village of Waunakee	12,097	2%	19,279	3%	7,182	59%
Northern (DeForest/Windsor)	12,997	3%	20,794	3%	7,797	60%
Village of Oregon	9,231	2%	13,619	2%	4,388	48%
Smaller USAs Total	26,740	5%	36,151	5%	9,411	35%
Rural Total	65,998	14%	73,785	12%	7,787	12%
County Total	488,073		637,429		149,356	31%

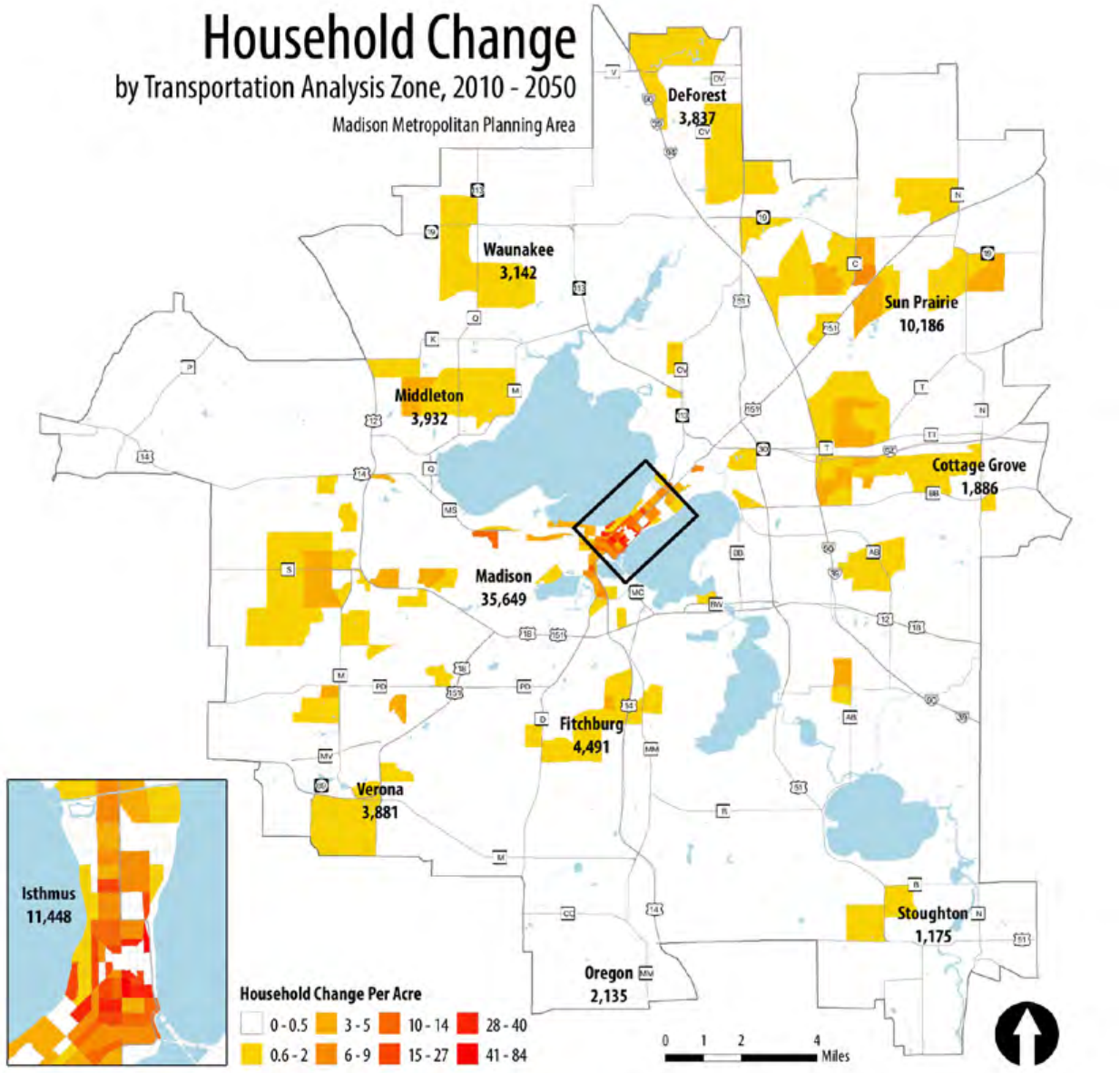


Figure 2-5: Change by Transportation Analysis Zone, 2010-2050

Households

While the population has continued to grow nationally and within the Madison region, the average size of a household has been in a decline. This decline has occurred for a number of reasons, including changing cultural norms, an increase in the percentage of single-person and two-person households, a reduction in the number of children each family is having, and an increase in elderly with the aging of the baby boomers. The US Census Bureau defines a household as "all the persons who occupy a housing unit as their usual place of residence. A housing unit is a house, an apartment, a mobile home, a group

Figure 2-6

Madison Metropolitan Area Households

2010 Census and 2050 Forecast

Municipality	2010 Census Households	2010 Census % of County	2050 Forecast Households	2050 Forecast % of County	Change Number	Change Percent
Central Urbanized Area Total	132,172	65%	177,828	62%	45,656	35%
City of Madison	103,132	51%	138,781	49%	35,649	35%
City of Fitchburg	10,015	5%	14,506	5%	4,491	45%
City of Middleton	8,085	4%	12,017	4%	3,932	49%
Village of McFarland	3,097	2%	4,268	2%	1,171	38%
Larger Outer Urbanized Area Total	36,164	18%	62,406	22%	26,242	73%
City of Sun Prairie	11,636	6%	21,822	8%	10,186	88%
City of Stoughton	5,133	3%	6,308	2%	1,175	23%
City of Verona	4,223	2%	8,104	3%	3,881	92%
Village of Cottage Grove	2,210	1%	4,096	1%	1,886	85%
Village of Waunakee	4,344	2%	7,486	3%	3,142	72%
Northern (DeForest/Windsor)	5,029	2%	8,866	3%	3,837	76%
Village of Oregon	3,589	2%	5,724	2%	2,135	59%
Smaller USAs Total	10,497	5%	15,850	6%	5,353	51%
Rural Total	24,917	12%	29,100	10%	4,183	17%
County Total	203,750		285,184		81,434	40%

of rooms, or a single room that is occupied as separate living quarters. The occupants may be a single family, one person living alone, two or more families living together, or any other group of related or unrelated persons who share living arrangements."

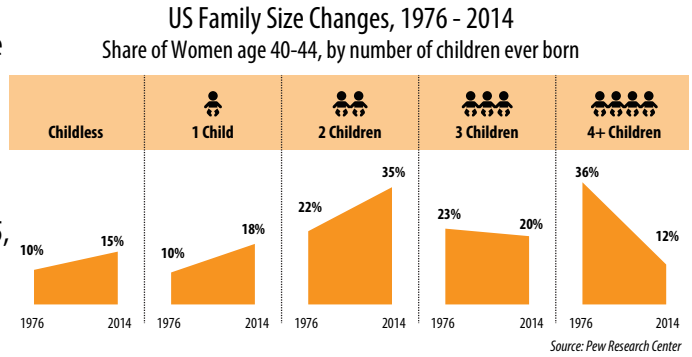


Figure 2-7: US Family Size Changes, 1976 - 2014

In 1970, the average US household size was 3.14. By 2015, the average US household size had fallen to 2.59. Here the trends have been similar – the average Dane County household size was 3.09 in 1970 and had dropped to 2.33 by 2010. Housing and household sizes are correlated with average house and household sizes larger in villages and towns, smaller in suburban cities, and the smallest in the City of Madison. The historic trend of shrinking household sizes is projected to continue in the future, with the City of Madison reaching an average household size of 2.03 by 2040, nearly 1 person less than 1970.

Average Household Size in Dane County Communities
Historical Census Data and Forecasts

	1970	1980	1990	2000	2010	Projections 2020	2030	2040
Towns	3.73	3.01	2.8	2.59	2.57	2.5	2.46	2.43
Villages	3.17	2.85	2.74	2.72	2.61	2.53	2.49	2.46
Small Cities	3.26	2.54	2.29	2.35	2.37	2.31	2.17	2.24
Madison	2.88	2.38	2.3	2.19	2.17	2.11	2.07	2.03
Dane County	3.09	2.56	2.46	2.37	2.33	2.27	2.23	2.2

Source: DOA

Figure 2-8: Average Household Size in Dane County Communities

Understanding trends in average household size along with other household characteristics is important because the makeup of households affects the demand for different types of housing and the location of that housing. For example, if the City of Madison has an average household size of 2.17 in 2010 and a population of 234,618, it can be surmised that over 108,000 housing units are needed to accommodate those residents. One of the ways that the City of Madison plans to accommodate future housing needs is through infill and redevelopment in existing and planning activity centers and in the downtown and Isthmus areas. In fact, infill and redevelopment areas such as the East Washington Avenue corridor are projected to accommodate well over 50% of all new households in the City of Madison between 2010 and 2050. Of those, around 11,500 are forecast to be located within the greater Isthmus area, more than even the City of Sun Prairie, the largest suburb. This is consistent with the trend over the past fifteen years and city policy.

Figure 2-5 on page 2-4 illustrates the areas with a large projected increase in households. While the City of Madison's percentage share of households and population is projected to continue to slowly decline, close to 36,000 or 50% of all future new households within the Metropolitan Planning Area are projected to be located within the central city.

Age

Much like the rest of the state, Dane County has a large elderly population that is projected to grow in the future. The percentage of Dane county's population aged 65 and older is expected to double from 10% to 20% between 2010 and 2040. This growth is partially due to the aging of the Baby Boomers generation as well as advances in medicine that have increased life expectancies. The growth of this population cohort comes at a time in which aging in place – living in one's own home and community, independently regardless of age, income, and ability – has become not only an expected consideration but a norm. A growing

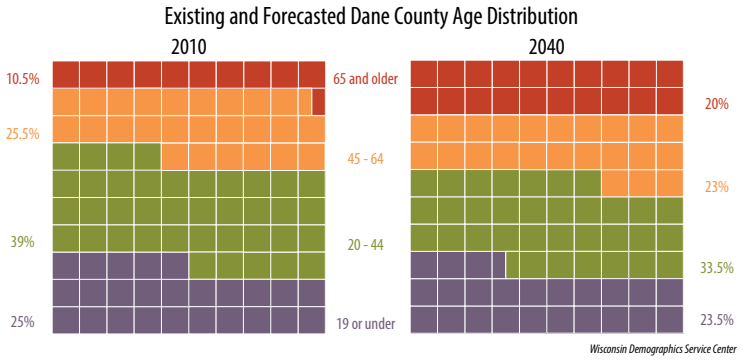


Figure 2-9: Existing and Forecasted Dane County Age Distribution

aging population, some of whom will not have the ability to transport themselves, will require a transportation network that will allow for safe and convenient transportation to grocery stores and other shopping destinations, entertainment, healthcare facilities, places of worship, and other destinations. Existing accommodations will have to be reinforced and future technologies explored to ensure adequate mobility and accessibility for all.



Race and Ethnicity

The United State has become and is projected to continue becoming more diverse. In fact, the Pew Research Center projects that more than 80% of population growth between 2010 and 2050 will be attributable to immigrants and their US-born descendants. This, in combination with higher fertility rates among African American, Hispanic American, and Asian American populations compared to the non-Hispanic white population, is driving the trend of growing diversity.

In the Madison region these trends have been evident as well. Between 2000 and 2010, the white population grew at a rate of 9% while the African American population grew at 49%, Asian American population grew at 56%, mixed races population at 59%, and other minority groups grew at 82%. Further, the Hispanic population grew at a rate of 101% compared to the Non-Hispanic population growth rate of 11%. This is important because of the different travel habits and residence location decisions of the minority versus white population. Of course, these choices may change in the future. See the Environmental Justice Analysis in Appendix B for more detailed information on the distribution of the minority population within the region and an analysis related to the equitable distribution of transportation resources.

Demographics of Dane County, 2010

Race

Race	Number 2010	Percent of Total 2010	Increase 2000 -2010
White	413,631	85%	9%
Black/African American	25,347	5%	49%
Asian	23,035	5%	56%
Other Minority	13,960	3%	82%
Two or More Races	12,100	3%	59%
Total Population	**488,073**	**100%**	**14%**

Ethnicity

Ethnicity	Number 2010	Percent Total 2010	Increase 2000-2010
Hispanic	28,925	6%	101%
Non Hispanic	459,148	94%	11%
Total Population	**488,073**	**100%**	**14%**

Figure 2-10: Demographics of Dane County, 2010

ECONOMICS

The location, density, and distribution of employment in relation to where employees live are some of the primary factors influencing travel demand. Though work trips make up less than 20% of all trips, they are generally the longest trip of the day and most occur during peak use times, driving the capacity needs of the transportation system. Often non-work trips are combined with work trips, contributing to congestion during the peak travel periods.

Dane County is home to the State's flagship university, the seat of state government, and to numerous biotechnology firms. Additionally, the region boasts strong healthcare, health and information technology, agribusiness/food, insurance, financial, and precision manufacturing industries. The regional economy is becoming increasingly private-sector driven. The diversity and concentration of employers within the county has led to the county having one of the lowest unemployment rates in Wisconsin, and being a net importer of employees. Within the County, the cities of Madison and Middleton have more jobs than workers living in the community. According to US Census data estimates, around 40,000 workers travel into Dane County per day from surrounding counties, while around 10,000 travel from Dane County to surrounding counties for work.

In the future, it is anticipated that Dane County will continue to import an increasing number of employees from surrounding counties. Between 2010 and 2050, Dane County's employment is forecast to increase from 314,000 to 398,700, while the

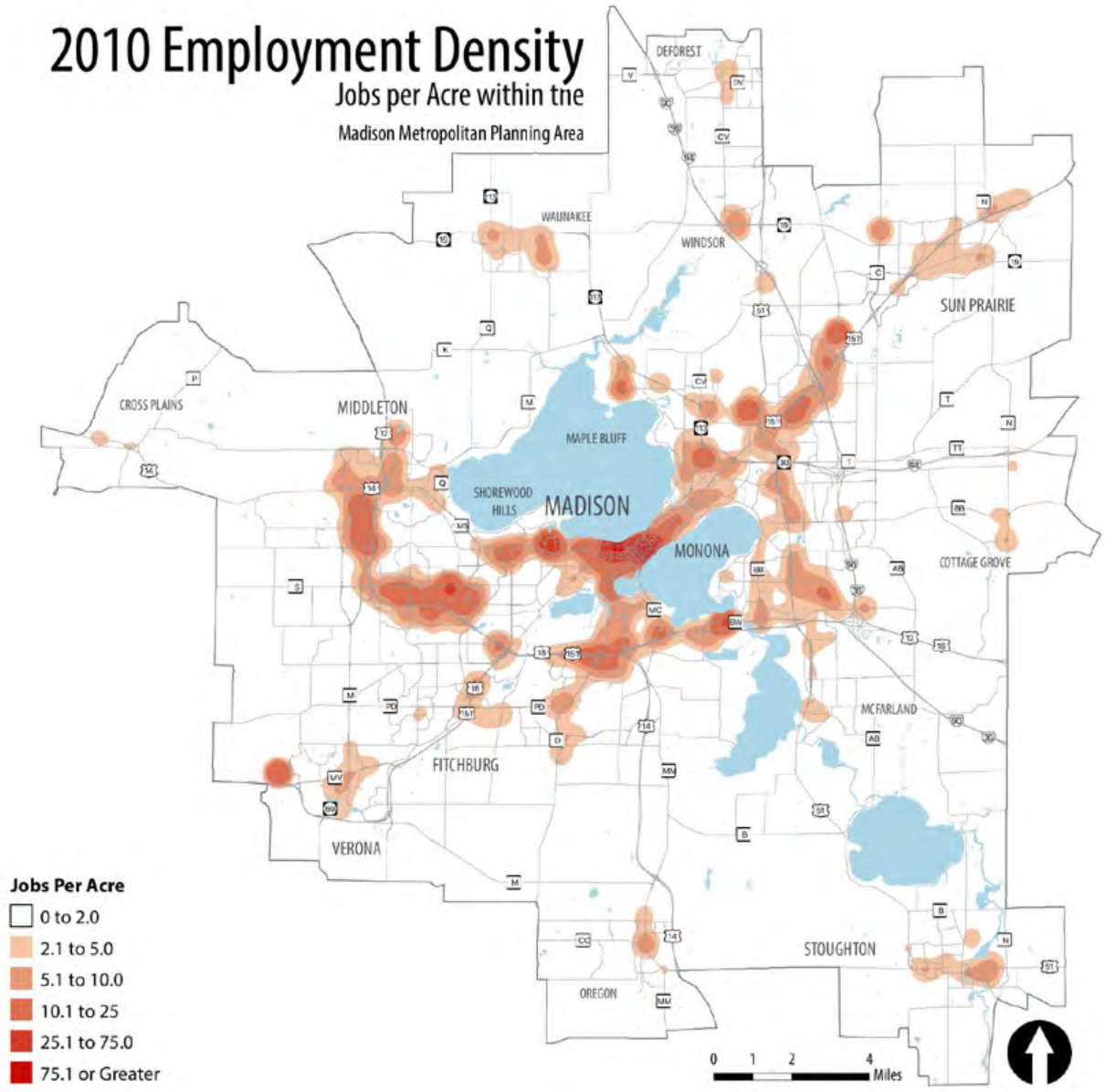


Figure 2-12: 2010 Employment Density

2050 resident employed labor force working in the county is projected to be 316,100. Assuming the percentage of Dane County workers working in other counties remains at 5.3%, the number of workers commuting into the county from other counties would increase to 99,300, a 136% increase from today's numbers.

While the City of Madison's share of employment is forecast to decline somewhat, total employment within the city is projected to grow by 46,000, accounting for over 50% of new employment within the Metropolitan Planning Area. Of that,

Figure 2-13

Madison Metropolitan Area Employment

2010 InfoUSA and 2050 Forecast

Municipality	2010 InfoUSA Employment	% of County	2050 Forecast Employment	% of County	Change Number	Change Percent
Central Urbanized Area Total	249,579	80%	307,366	77%	57,787	23%
City of Madison	195,888	62%	241,093	60%	45,205	23%
City of Fitchburg	12,165	4%	17,967	5%	5,802	48%
City of Middleton	19,104	6%	22,941	6%	3,837	20%
Village of McFarland	1,943	1%	2,511	1%	568	29%
Larger Outer Urbanized Area Total	45,094	14%	70,545	18%	25,451	56%
City of Sun Prairie	11,362	4%	15,168	4%	3,806	34%
City of Stoughton	6,445	2%	6,625	2%	180	3%
City of Verona	9,315	3%	22,280	6%	12,965	139%
Village of Cottage Grove	2,625	1%	4,287	1%	1,662	63%
Village of Waunakee	5,901	1%	8,406	2%	2,505	42%
Northern (DeForest/Windsor)	6,054	2%	9,737	2%	3,683	61%
Village of Oregon	3,392	1%	4,042	1%	650	19.16%
Smaller USAs Total	9,567	3%	11,267	3%	1,700	18%
Rural Total	9,478	3%	9,480	2%	2	0%
County Total	313,718		398,658		84,940	27%

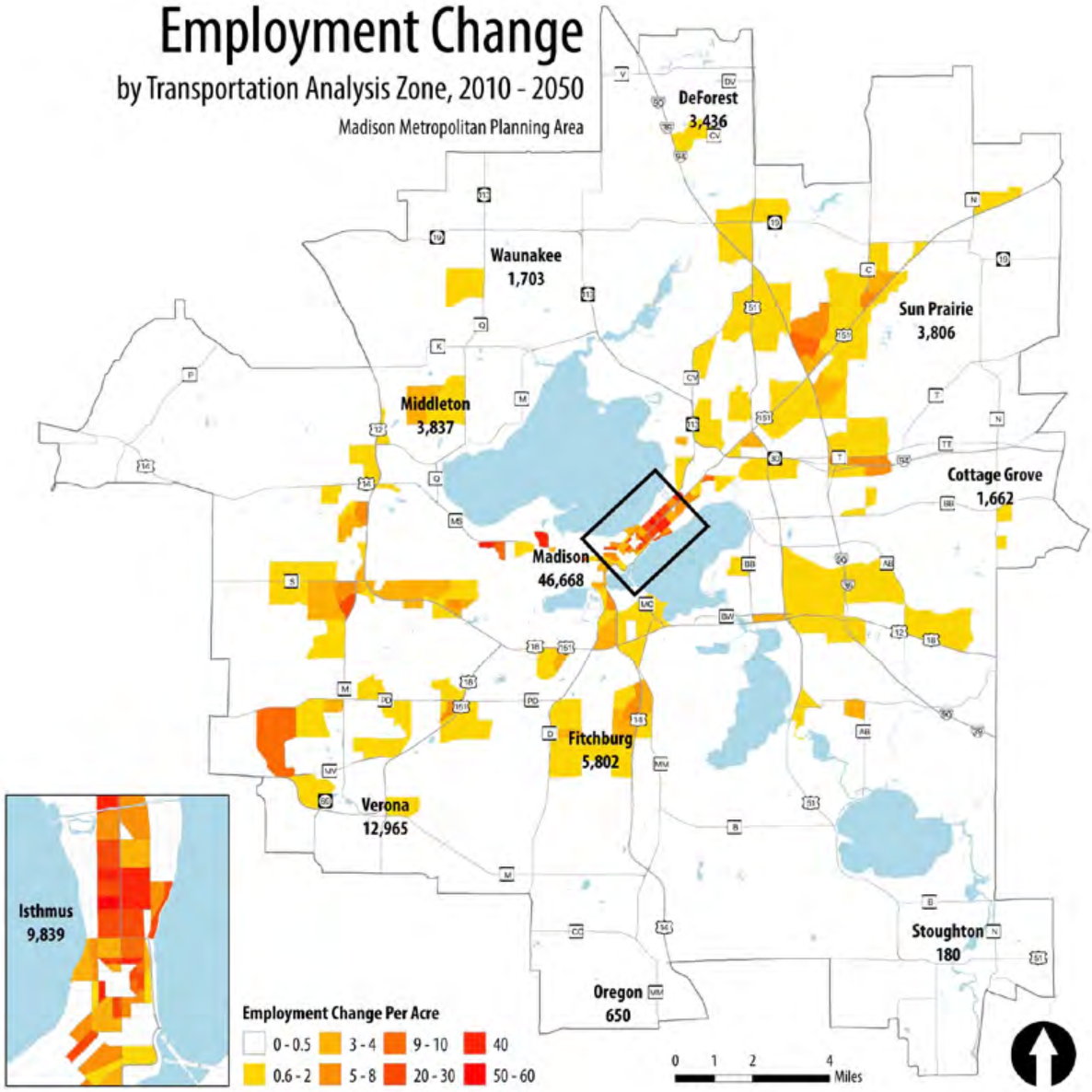
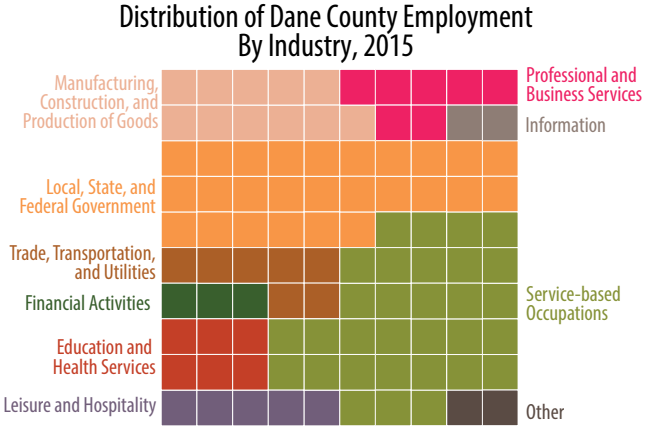


Figure 2-14: Employment Change 2010 - 2050

around 10,000 new jobs are forecast within the Isthmus area. This is largely based on projections for the Capitol East District, developed to assess future parking demand and other necessary improvements. Among suburban communities, the City of Verona's employment is expected to grow by far the most, largely due to Epic Systems, the county's largest private employer. However, Fitchburg, Sun Prairie, Middleton, DeForest, and Cottage Grove are all expected to have a healthy increase in employment.



2015 Annual BLS County-level QCEW Data

Figure 2-15: Distribution of Dane County Employment by Industry, 2015

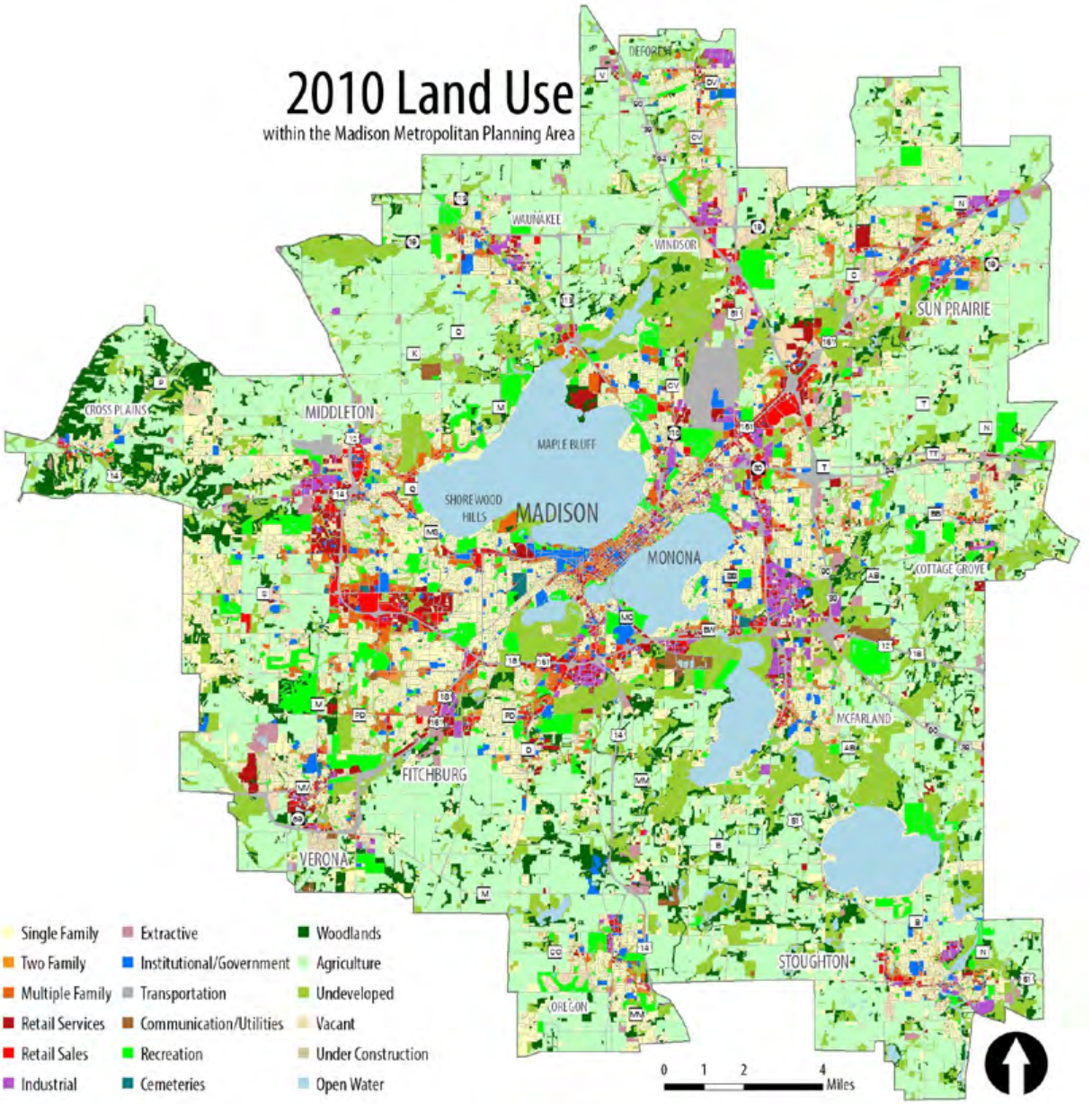


Figure 2-16: 2010 Land Use

LAND USE

The mix, location, and density of land uses determines travel demand. This means that land use and site configuration have a direct impact on the types of transportation facilities and services that are needed in an area. For example, residential land uses must have access to places of employment, stores, schools, and entertainment; therefore, it is imperative that there are roadway, transit, bicycle, and pedestrian connections between land uses. The distance between and density of the land uses influences the type of transportation one may use for a specific trip and whether the trip will be made as an individual trip or in a chain of trips.

Conversely, the availability of transportation facilities may influence whether a development is viable or not. For example, without convenient highway access, large retailers on the urban periphery may not be able to attract customers. Similarly, industrial areas are less likely to succeed without easy access to interstate highways or other major freight corridors. Land use

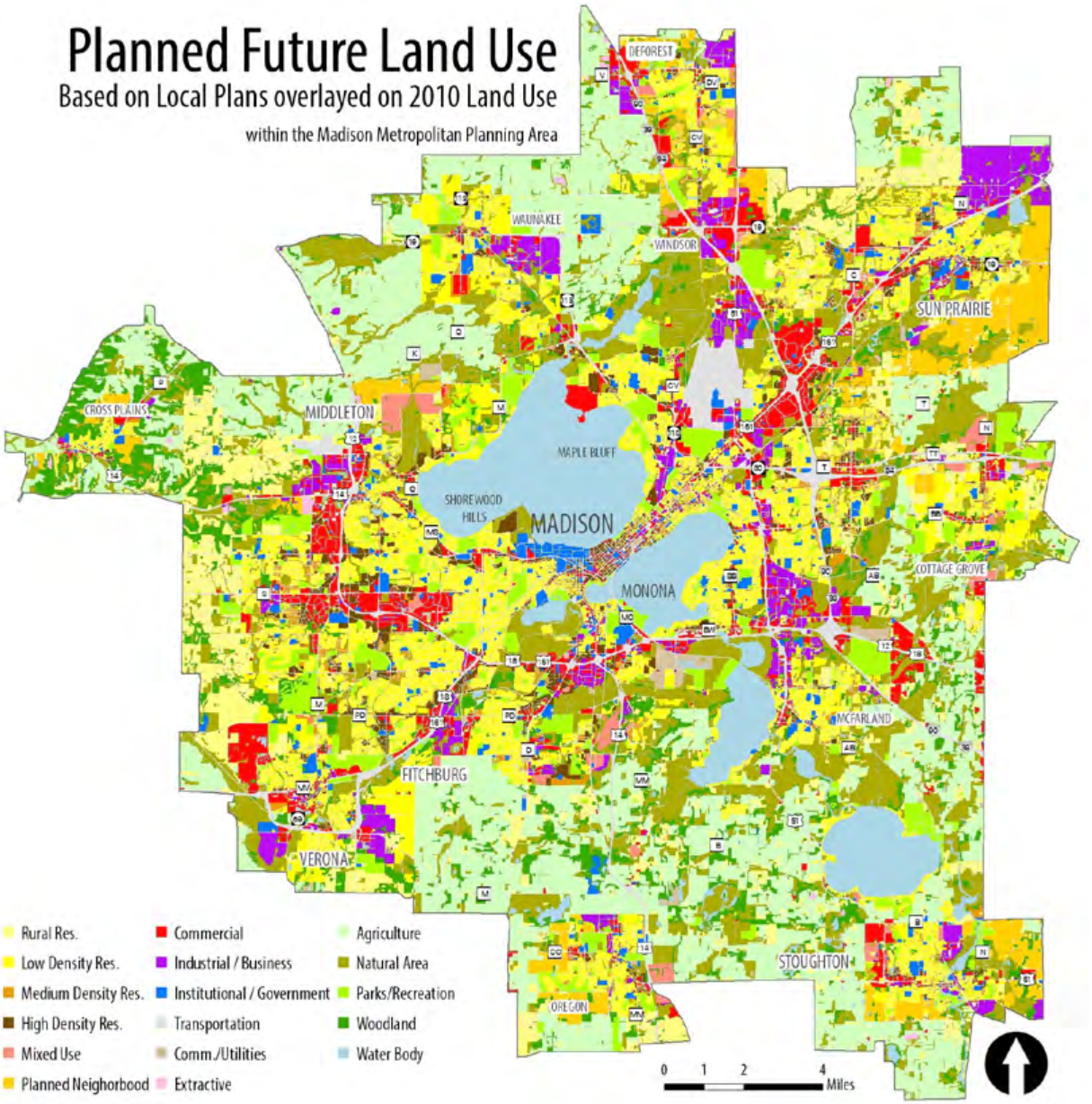


Figure 2-17: Planned Future Land Use

and transportation facilities are inextricably linked.

Figure 2-16 shows the location of existing land uses in the Madison Metropolitan Planning area. Some of the most intense or dense uses include two and multifamily residences, commercial, and institutional/governmental. These uses tend to be concentrated in downtown Madison, the Isthmus, and along major transportation corridors in communities throughout the area. Trip generating uses, such as retail sales/services and industrial uses, agglomerate near one another in areas with strong access to regional or interstate facilities. Less intense uses, such as single family homes, tend to locate within, at a minimum, driving distance to major regional transportation corridors and away from intense or trip generating uses.

A number of urban planning models have been developed to determine how land use, transportation facilities, and density interact. One prominent contemporary model, the Rural-to-Urban Transect, suggests that urbanism occurs in symbiotic

transects. The Transect describes levels of urbanization that range from a natural rural preserve to a dense urban core. Each of these typologies is symbolic of different development patterns and requires different transportation facilities. One of the benefits of this model is that it demonstrates the similarity between zones that may not appear to be similar, but have similar characteristics and require similar transportation treatments.

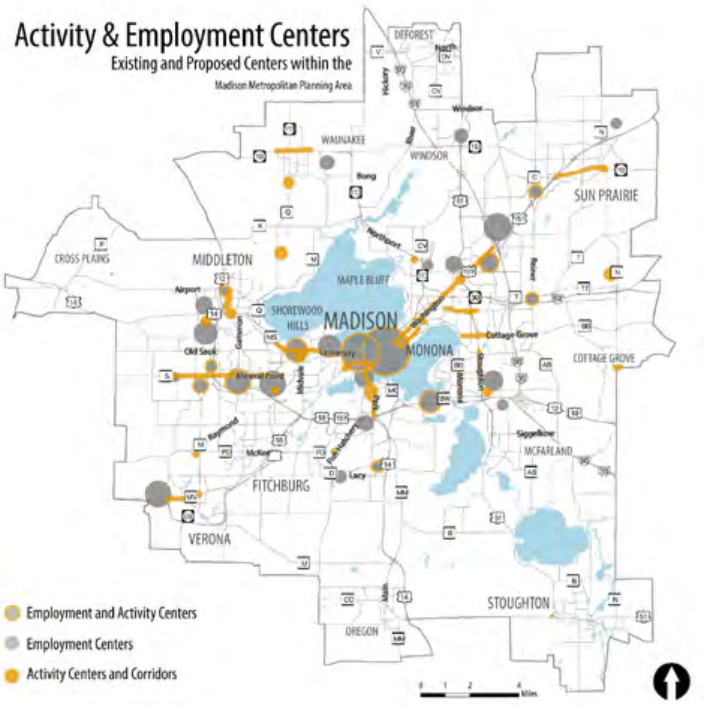


Figure 2-18: Activity and Employment Centers

For instance, the Madison neighborhood of Hill Farms near University Avenue has similar transportation needs to that of the Schenk-Atwood-Starkweather-Yahara (SASY) neighborhood. Though the densest portion of Hill Farms would be viewed a contemporary, transit-oriented development and SASY is an older neighborhood built around a defunct streetcar line, both require high-quality transit service, quality pedestrian and bicycle facilities, and regional transportation for moving residents, workers, shoppers, and freight. The Transect would identify them both as "urban center" zones, and require similar facilities.

In the past, communities did not deviate from the gradient shown in the Transect – an urban core buoyed a community, with urbanity dissipating into suburban and then rural form gradually as one moves away from the core. This configuration encourages driving in the periphery and forces traffic into one dense core. Contemporary configurations retrofit dense activity centers into areas that have been traditionally home to suburban or general urban development or build them as part of new developments. This configuration change increases pedestrian and bicycle activity, while making transit more viable. The development of high-density, mixed-use activity centers, primarily along existing and planned major transit corridors is a central recommendation of the City of Madison's Madison in Motion Transportation Plan and this RTP. The development of these centers, illustrated in Figure 2-18, is reflected in the land use growth forecast for the RTP.

Figure 2-17 on page 2-10 shows planned future land use based on local land use plans. The map, along with input from local planners and officials, served as a guide for the growth forecasts used to estimate future travel demand for the RTP using the regional travel model. It should be noted that the growth forecast for the RTP constituted far less than the complete build out of plans reflected in the map due to differences in the timeframe of local plans, and the need for the RTP growth scenario to adhere to county forecast control totals for households, population, and employment.

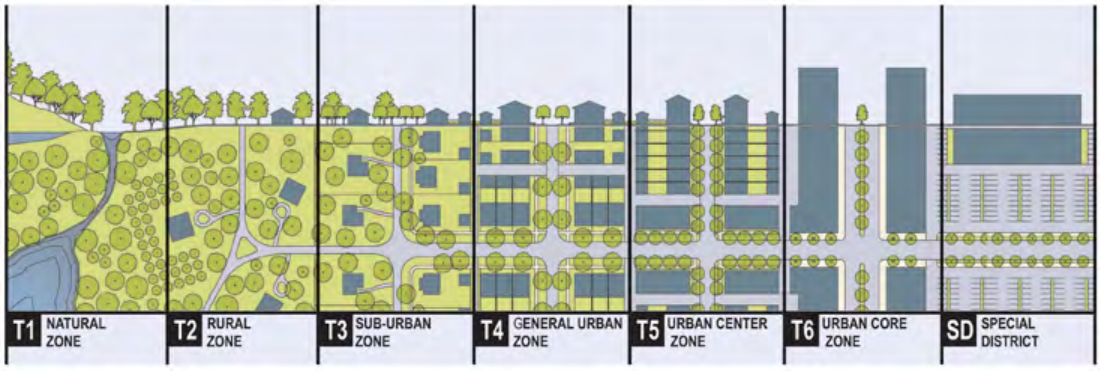
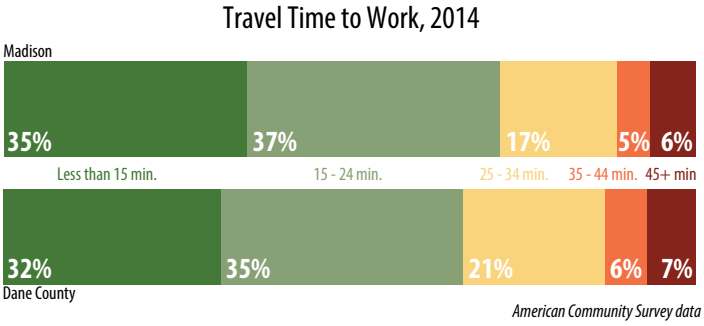


Figure 2-19: Rural to Urban Transect

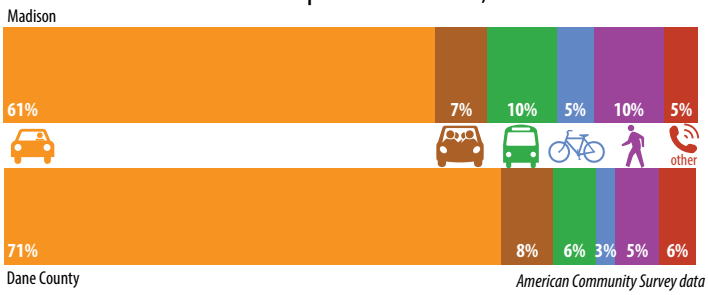
COMMUTING PATTERNS

Commuting describes travel that is made to and from a place of employment. In the Madison area, the most dense concentration of employment is in the downtown Madison/UW Campus area; however, over the last few decades most of the new employment growth has occurred in peripheral Madison and suburban job centers, such as the American Center, Old Sauk Trails, UW Research Park, Middleton Business Park, Fitchburg Center, and Epic campus. As a result, travel patterns are becoming more disbursed throughout the region.



American Community Survey data

Figure 2-20: Travel Time to Work, 2014



American Community Survey data

Figure 2-21: Mode of Transportation to Work, 2014

The mode and time it takes for someone to get to work are directly related to where people live. People who live in urban environments generally have shorter commutes than their rural counterparts and more modal options available for their commute. In Dane County, 71% of all residents drive alone to get to work, compared to 61% in the City of Madison. City residents were also more likely to take transit, walk, and bike to work. County residents were more likely to carpool to work or utilize other commuting methods, such as telecommuting.

Over the last five years, a number of new apartment buildings have been constructed in downtown Madison and on the Isthmus. These new buildings have attracted a residential population of young professionals. While many of these new residents may be moving to downtown to be closer to work, others are doing so in an effort to live a more urban lifestyle while working in the periphery of the region. This results in so called "reverse commuting."

One particularly popular reverse commute is between downtown Madison and the Epic campus on the western edge of the City of Verona. In 2012, Epic employed more than 6,200 employees. Understanding that many Epic employees were commuting from Madison to Verona, Metro Transit, the City of Verona, and Epic worked to add two new bus routes – one connecting the campus to downtown Madison and the other connecting to the West Transfer point. Ridership has been so strong on the routes that buses were added in 2015. As of 2015, Epic had grown to more than 9,000 employees.

As mentioned previously, Dane County is a net importer of workers due to having a surplus of jobs and stronger economy than surrounding counties. Figure 2-21 on page 2-13 shows county-to-county average daily commuter flows based on 2009 - 2013 American Community Survey data. The counties supplying Dane County with the most workers per day (all over 4,000) include



The large Epic Systems corporate campus in western Verona.

Columbia, Rock, Green, Jefferson, and Sauk. More than 1,000 workers per day leave Dane County for work in each of the following counties: Rock, Columbia, Sauk, and Jefferson Counties.

As the major employment hub, the City of Madison experiences a large influx of workers from other communities within the county as well as from outside the county. It is estimated that about 63,000 workers commuted to the city from other communities in Dane County in 2014. Figure 2-23 shows the percentage of residents within each community that are commuting to the City of Madison for work. Incorporated communities with the most workers commuting to Madison were some of its closest neighbors, including the Village of Shorewood Hills (68%), Village of Maple Bluff (62%), Town of Madison (60%), City of Fitchburg (58%), City of Monona (54%), and Village of Brooklyn (51%). Many unincorporated towns had more than 45% of all workers commuting to the City of Madison including the Towns of Dane, Vermont, Vienna, Bristol, Cottage Grove, Madison, Blooming Grove, and Middleton.

One way that the region mitigates the traffic impact of regional commuting is the Wisconsin Department of Administration (DOA) run State of Wisconsin Vanpool Program. The Vanpool Program allows groups of 8 to 15 commuters from various parts of southern Wisconsin ride to work each day together. Vanpools are more formally structured than carpools, due to the cost of operating and insuring the vans. DOA provides this structure, collecting a biweekly fee from all van riders to cover gasoline, vehicle maintenance, and insurance for all participants. Emergency guaranteed rides home are provided through MATPB's Rideshare etc. program up to three times per year.

There are currently over 900 riders utilizing 80 vans originating in communities all across southern Wisconsin. Some vanpool participants come from communities as close to Madison as McFarland, while others travel as far away as Milwaukee and Racine. Some of the more popular vanpools origins include Janesville, Milwaukee, Waukesha, and Portage.

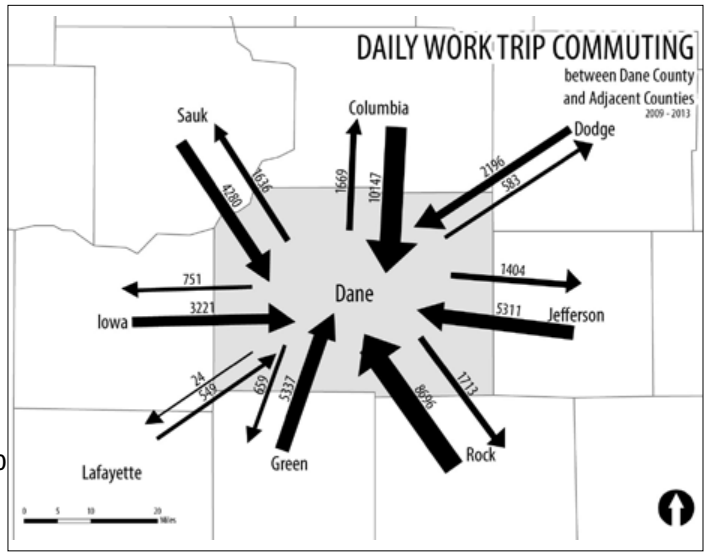


Figure 2-22: Daily Work Trip Commuting between Dane and Adjacent Counties

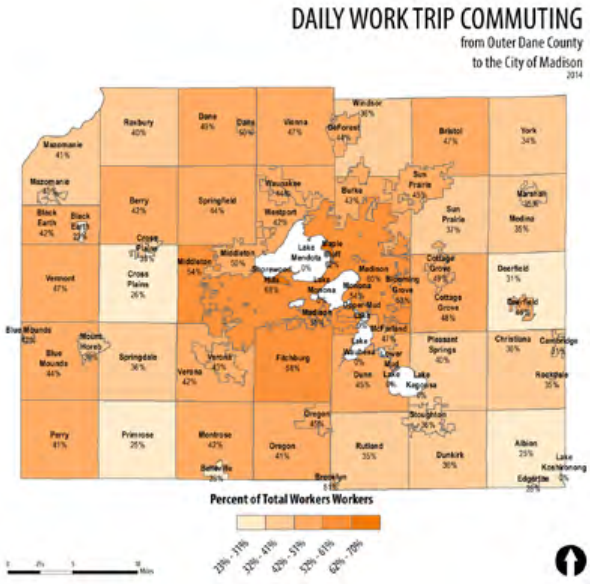


Figure 2-23: Daily Work Trip Commuting from Dane County to the City of Madison

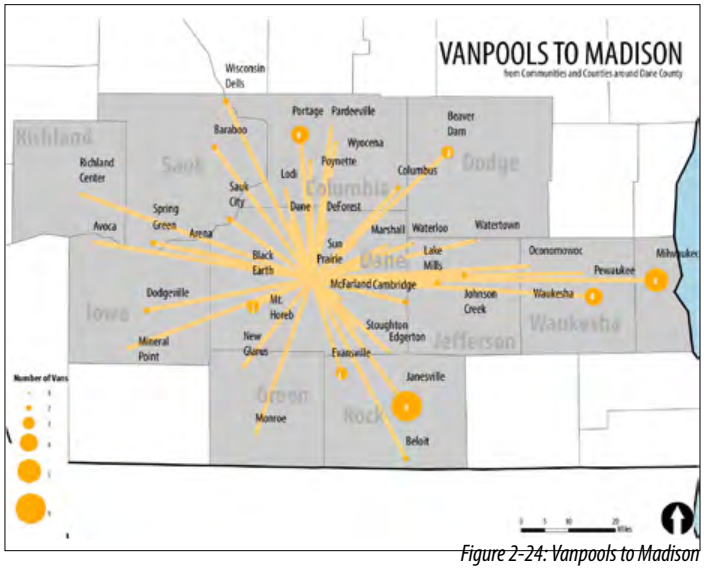


Figure 2-24: Vanpools to Madison

EMERGING TECHNOLOGIES

Transportation is currently experiencing a rapid change not seen since the early 20th century. Some of this change is due to changes in personal preferences, such as the increase in freight going directly to home due to the rise of online shopping, while other changes are due to the advent of new technologies. In the 2015 report Transportation Technology Scan: A Look-Ahead, the US DOT identified 11 technological advances and innovative concepts that could fundamentally alter the transportation landscape and their potential benefits, challenges, and potential issues. These technologies include:

Additive manufacturing (3D printing) is a technology that allows for three-dimensional objects to be created using an extruder or laser layer by layer. This technology has the potential to upend the manufacturing process by replacing the transfer of parts with the transfer of designs over the internet, allowing parts to be printed on-site. This could reduce the need for warehouses and shipping services – lessening the number of heavy vehicles on roadways.

- Benefits of this technology include more localized production of goods, reducing regional roadway infrastructure needs – some of the most expensive roadways in the transportation system. This may reduce the cost of low-volume vehicle parts, including the cost of transit vehicle replacement parts and allow for the purchase of hard to find/procure parts.
- Potential downsides with this technology include an increased need for high-quality local infrastructure due to the nature of more goods being produced locally.

Advanced analytics and machine learning are technologies that provide computers with the ability to learn without explicitly being programmed, particularly when being inputted with "big data."

- Example programs are being created with the capability of using big data to identify patterns that can be used to make well-informed predictions such as traffic models. Some traffic operations centers have automated traffic operations systems that automatically adapt signalization during periods of high traffic or alert operators of potential traffic accidents. An adaptive signal system was installed in the McKee Road and Fish Hatchery Road corridors as part of the Beltline/Verona Road construction project and a similar system is planned for the University Avenue corridor.
- Benefits include increased efficiency of existing roadways through predictive analytics and pre-trip guidance for travelers and increased safety due to automatic dispatching of 911 services through a mixture of this technology and the "internet of things."

Automated vehicles are vehicles in which at least some aspect of safety-critical control functions occurs without driver input. Over time, it is anticipated that vehicles will gradually gain more autonomy. Because of this continuum of automation, "levels of vehicle automation" have been developed to quantify levels of driver reliance. A vehicle with a rating of 0 has no automation and requires the driver to manage all control functions, while a rating of 5 is completely automated and requires not human management during the trip.

- Examples of vehicle automation are becoming more mainstream each year. Many higher-end vehicles

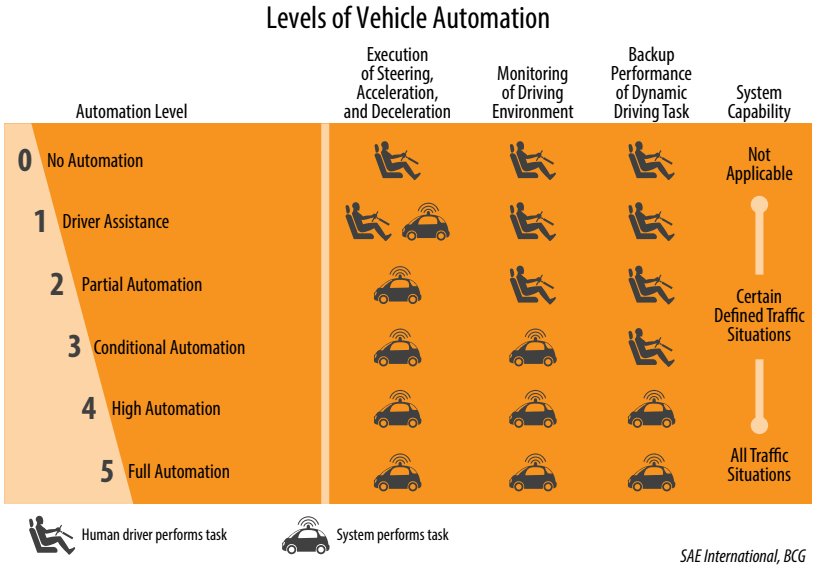


Figure 2-25: Levels of Vehicle Automation

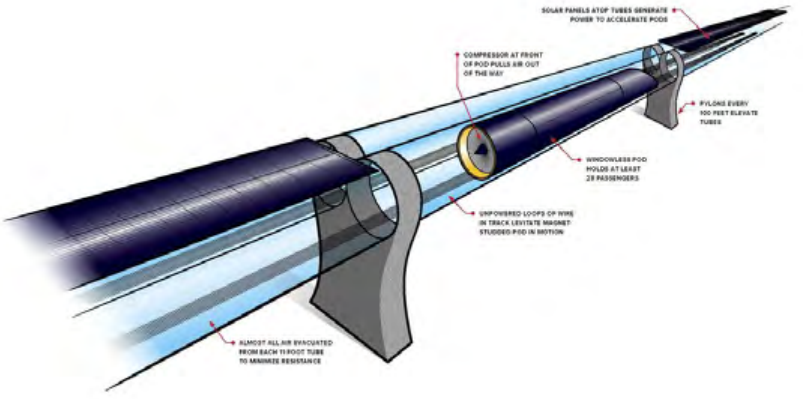


currently come with automated features such as parking assist and crash avoidance. Some automakers, such as Tesla, have released highway autopilot features or are planning on releasing them in the near future.

- Benefits of this technology include improved safety, reduced travel times, reduced energy consumption, reduced vehicle emissions, improved reliability, increased roadway capacity (due to closer vehicle spacing), and increased transit accessibility. Vehicle sharing could become much more attractive since they would be able to provide door-to-door service for all riders. Work zone safety would be greatly improved. Transit service could be delivered at a reasonable cost in lower-density communities.
- Potential Issues of this technology include a dramatic increase in vehicle miles traveled due to "drivers" that would otherwise be unable to use the roadway. A reduction in driving stress may lead to an increase in discretionary travel and increased urban sprawl. The transition period from traditional cars to autonomous vehicles may be difficult due to low public acceptance of the vehicles and cost barriers for low-income or elderly traveler. Further, the unknowns of this technology make it difficult to determine whether capacity expansion is an appropriate treatment for congested or unreliable roadways. Parking lots and related facilities could be rendered obsolete because vehicles will have the ability to drop off passengers and return to their origin or pick up other passengers.

Hyperloop is an intercity travel concept in which patrons travel on a fixed route of paired bi-directional tubes on elevated pylons, traveling in capsules riding on low-friction air bearings within those tubes at speeds of up to 750 miles per hour.

- Benefits of this technology include the ability to reach far away destinations in a fraction of the time it would take to use conventional options – such as regional buses or airplanes. The technology could lead to economic



Hyperloop concept, CNET.com

development benefits for regions and cities it serves. It has the potential to save a great deal of energy, emissions, and time over existing transportation modes.



US DOT

Infrastructure inspection robots can be used to assess the structural integrity of a variety of infrastructure using sensors and 3D imaging.

- Benefits of this technology include the ability for governmental agencies to examine and assess more infrastructure due to the speed of robots in comparison to humans; improved and more comprehensive inspections that result in improved reliability, safety, and infrastructure longevity; better assessment of infrastructure at disaster sites; and a reduction in inspection-related traffic disruptions.

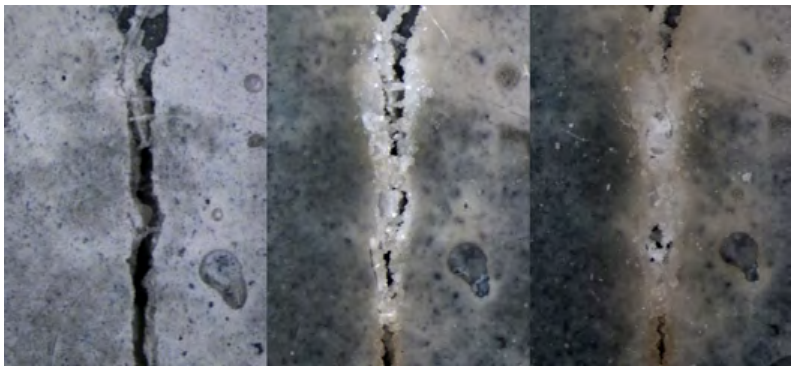
Innovative concepts for protecting pedestrians, bicyclists, and motorcyclists are improvements in traffic safety for "vulnerable road users." These improvements range from vehicle safety mechanisms such as sensor-based detection systems to pedestrian guards on freight trucks.

- Examples of this type of technology include advanced driver assistance systems (ADAD) that alert drivers of objects or people nearby using radar, sonar, or infrared signals; technologies that apply breaks to avoid crashes; and technologies that avoid collisions by cooperative communication between cell-phone signals of vulnerable users and vehicles to notify both parties of potential issues.
- Benefits of this technology include increased safety for all roadway users. Additionally, this could lead to an increase in multimodal activity (and thus lower VMT) due to increased confidence in safety by vulnerable users.

The **Internet of Things** is the network of interconnected, uniquely identifiable devices embedded in physical objects or "things."

- Examples of this technology include applications that monitor and control energy use, cloud-connected wearable devices that track physical conditions, and vehicle-to-infrastructure technology that is currently in development.
- Benefits of this technology include a better understanding of infrastructure utilization (more accurate tracking of usage patterns), safety improvements (tracking mental alertness for professional transportation operators and real-time monitoring of environmental hazards), and improved operations for freight (robotic loading and unloading) .

Materials science in infrastructure is technological advancements in the materials used to produce and repair physical infrastructures, such as roads and bridges. New materials such as self-healing roads have been shown to extend asphalt life by more than 50%. These pavements work by mixing organic matter into the pavement to produce limestone or other filling materials when exposed to water and heat, filling and seal cracks as they occur.



Bioconcrete though the healing process. Delft University.

- Benefits of this technology include increasing the lifespan, resilience, and safety of infrastructure while reducing maintenance needs, costs and environmental impact. Increased roadway lifespan will reduce traffic disruptions caused by roadway reconditioning and reconstruction. Improved roadway conditions will reduce driver and cyclist maintenance cost and improve the quality of travel. Reductions in road repair need will reduce CO_2 emissions from cement production and construction.
- Potential challenges associated with this technology include a need to train workers in new construction and maintenance techniques.

On-demand ride services (sometimes called ridesharing or transportation network companies) are services that use smartphone applications to connect passengers to drivers. In many ways this is not very different than traditional taxi service; however, the increased price transparency and availability of travel information (such as arrival times and GPS locations) have caused these services to increase in popularity.



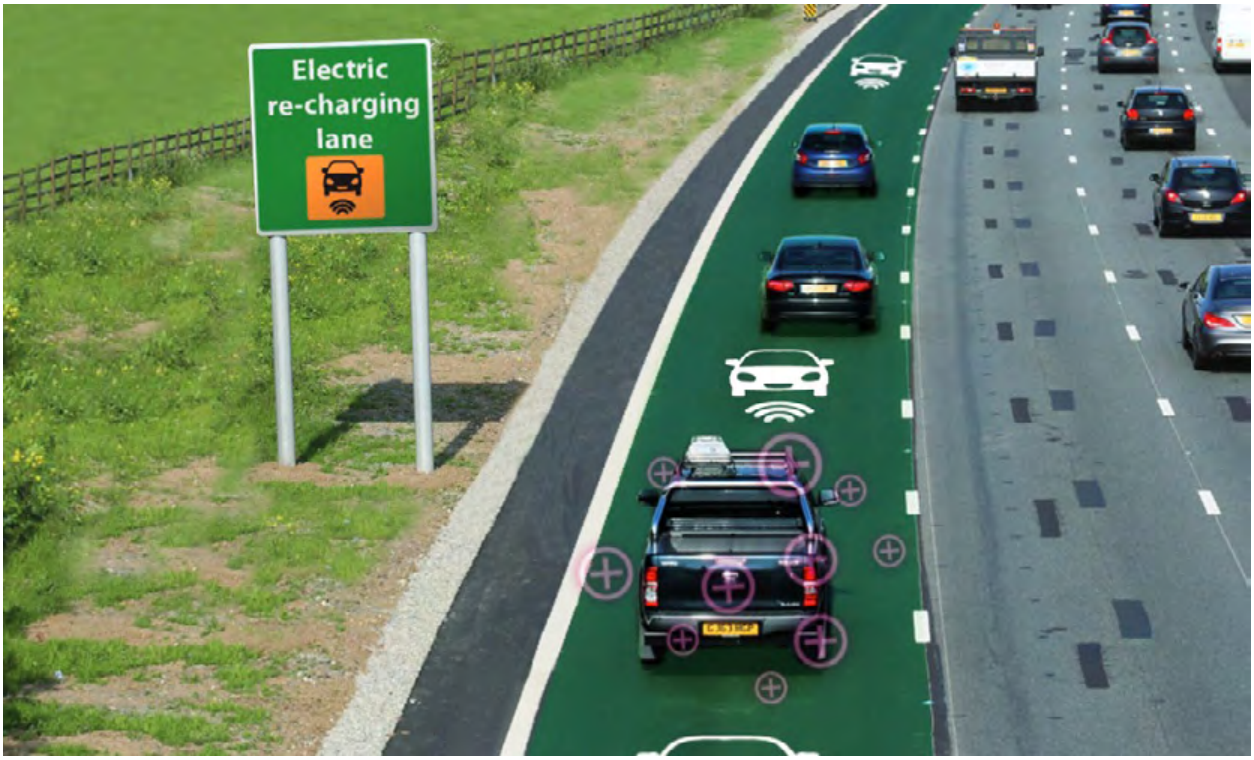
Self-Driving Uber in Pittsburgh, PA. Businessinsider.com

- Examples of this type of service include Lyft and Uber. Local services, such as Green Cab, also utilize similar functionality.
- Benefits of this technology include encouraging multimodal travel by making it possible to move away from automobile ownership when combined with other transportation options such as walking, bike sharing, and transit. If applied to transit, the technology could help agencies discover new fixed-routes that may not have otherwise been apparent and also address "first mile, last mile" connection problems. This technology could improve acceptance of autonomous vehicles by increasing the availability of automated vehicles and lowering entrance costs by allowing rental.
- Issues with this type of service include displacement of transit trips and/or active transportation trips if the services are too inexpensive or convenient, resulting in increased VMT and negative environmental impacts.

Unmanned aircraft systems (UAS) (also commonly called drones or unmanned aerial vehicles (UAV)) are aircraft without a human pilot aboard. While these vehicles are currently controlled by operators on the ground, future vehicles will have the ability to operate without a human operator. In fact, the US DOT estimated that the total number of UAS in operation could surpass the number of manned aircraft by 2035.


Delivery Drone Concept, Amazon.com

- This technology is currently used in military situations, law enforcement, firefighting, border patrol, disaster release, search and rescue, construction management, transportation facility inspection, and roadway condition inspection.
- Benefits of this technology include "find and deliver" capabilities that could find people or objects that are lost, reduction of roadway congestion due to drone-based package delivery, increased speed of package delivery, and the ability to solve first-and-last mile freight issues in congested urban environments.
- Potential challenges include reduced quality-of-life due to noise and visual intrusion, safety concerns due to recreational drones, and privacy concerns.



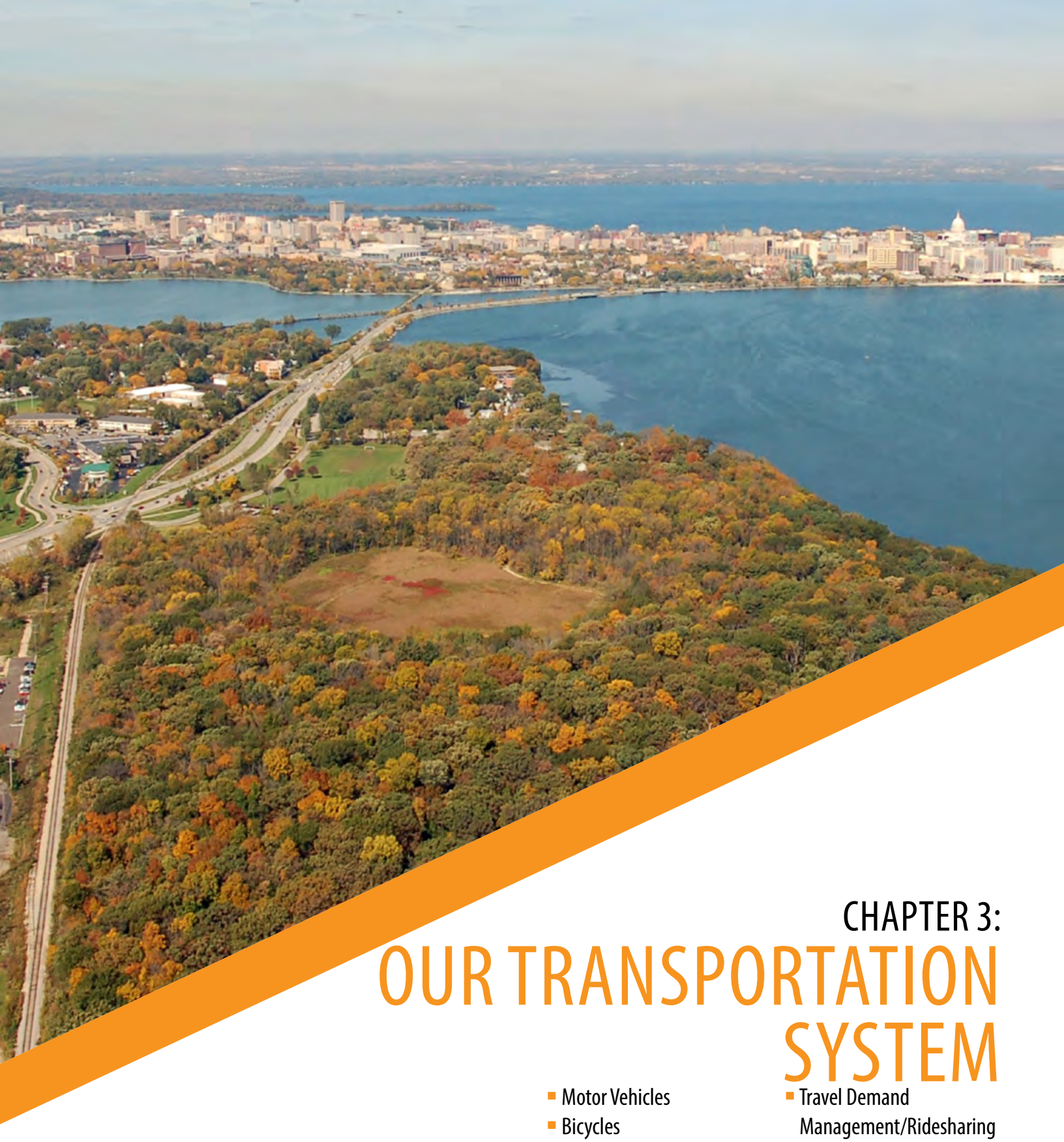
Wireless charging Concept, Intel Corporation

Wireless power transfer is a technology that allows for the recharging of electronic devices with chargers and cables. Initially, it is likely that electric buses and other vehicles traveling on high traffic corridors could be the first adopters of this technology to justify the capital investment cost. Once the technology becomes less expensive, light-duty and consumer vehicles are likely to follow. In addition to wireless power transfer, distributed fast charging has the potential to change the entire transit system. Developers of this technology claim that electric powered buses can be charged in as little as five minutes. This could allow for charging at places where transit vehicles taxi throughout the area, such as the Capitol Square and at transfer points.

- This technology is currently being used with some smartphones and has been used in pilot projects by transit providers in Utah, Texas, and Calfornia.[2]
- Benefits of this technology include limiting the need for individual consumers to have reliable access to charging stations. It would also extend the driving range of electric vehicles by providing charging capability on major roadways, a potential boon for automated vehicles. The technology also allows vehicles to have smaller batteries – reducing weight and improving efficiency. Further, the environmental benefits would be substantial. Smaller batteries reduce the environmental impact of electric vehicle batteries cannot currently be discarded in an environmentally cost-neutral way.

While many of these technologies on their own would be transformational, the confluence of a number of them into the transportation system at once poses more questions than answers for manufacturers, consumers, and planners. It will be important to determine quantifiable ways that the new technologies will impact planning – be it newfound capacity, cost savings, or a complete reimagining of the transportation system. It will be important, now more than ever, to recalibrate planning efforts based on these, and other, emerging technologies and remain flexible, nimble, and adaptable in the coming years.

[2] http://wave-ipt.com/projects



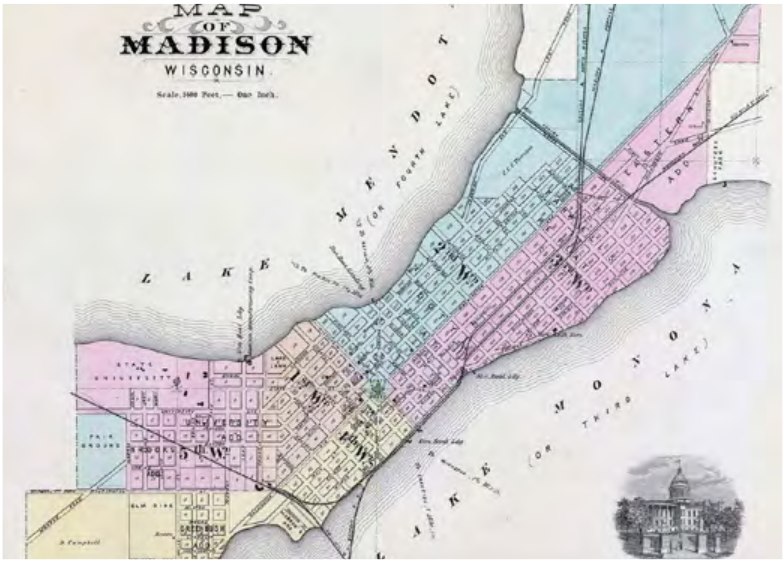
CHAPTER 3:
OUR TRANSPORTATION SYSTEM

- Motor Vehicles
- Bicycles
- Pedestrians
- Public Transit
- Travel Demand Management/Ridesharing
- Inter-Regional Travel
- Freight/Goods Movement

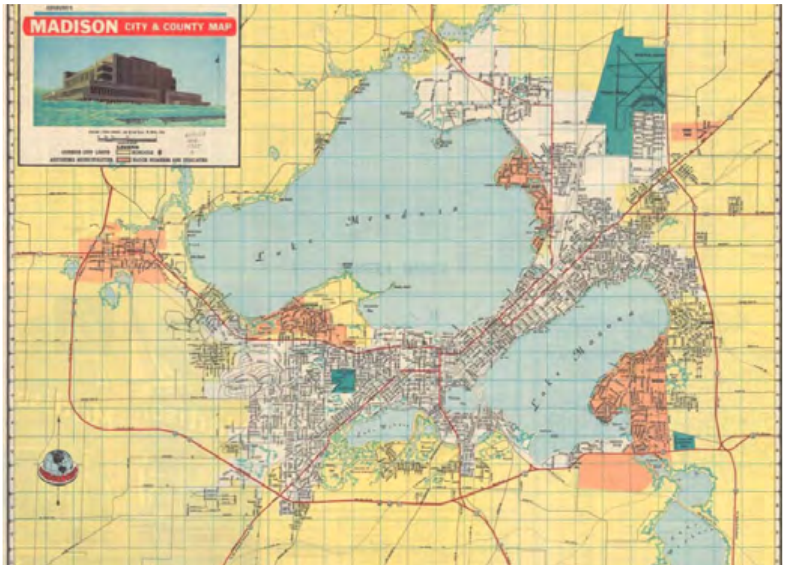
MOTOR VEHICLES

Introduction

Streets and highways form the foundation of the transportation system. They are used by and must be designed to accommodate safe, convenient travel by buses, bicyclists, and pedestrians, as well as motorists. There are over 2,800 miles of public roadways in the Madison Metropolitan Area and close to 550 bridges. Roads are critical to virtually all freight moving to and from locations in Dane County. 98% of Dane County's freight tonnage and 92% of its freight value moves exclusively by truck. The remainder, which moves by other modes for part of its trip, needs to travel by truck on the first or last legs of its journey. Countywide, the roadway system carries an estimated 13.6 million vehicle miles of travel each day. Roadways also have both direct and indirect impacts on the natural environment that must be considered in planning efforts and facility design.



Madison, 1878 Credit DaveRumsey.com.



Madison, 1950s after the construction of the Beltline. Credit University of Texas at Austin University of Texas Libraries

Streets and highways provide connectivity to jobs, homes, shops, parks, and other opportunities. The physical design characteristics of each roadway play a significant role in its safety, operational performance, and accommodation of different transportation modes. As an infrastructure asset, the roadway system requires maintenance to remain in acceptable condition.

The Madison area has a uniquely constrained roadway system due to the natural geography of the area, with the City of Madison's downtown sitting on an isthmus. The City of Madison, founded in 1848, is a master planned community built on a tight grid of streets around what we now know as the Capitol Square. High volume arterial streets radiate from the square and connect to a number of State and Interstate Highways including the Beltline (US Highways 12, 14, 18, and 151), Stoughton Road (US Highway 51), and I-39/90/94. Unlike many urban areas, downtown Madison is located off the freeway and expressway network. This has greatly contributed to the livability of the downtown, but also made traffic circulation more challenging, increasing the importance of travel demand management and operational strategies for mitigating congestion. Many suburban communities surrounding Madison were founded in the late 1800s, and contain a similarly dense street grid in their historic cores.

Roadway development patterns changed across the United States after World War II. America built most of its early highway and freeway infrastructure during this time, leading to the rise of suburbanization. Terms like roadway hierarchy became part of the planning lexicon, and curvilinear streets and cul-de-sacs became the norm for new neighborhood design. The Madison area was no exception to national trends. The construction of the Beltline Highway facilitated growth in areas further from the urban core, including the suburbs. Conceived and approved in 1944, the Beltline opened as a 2-lane highway in 1949.

In the 1950s, intersections with the Beltline were steadily converted into interchanges and portions of the road widened to four lanes. In the 1970s, portions of the roadway were expanded to six lanes. Currently, WisDOT is studying the roadway to determine ways to further improve the efficiency, reliability, and safety of this highly traveled freeway, which provides the only east-west connection south of the urban core between the Interstate and the west side.

The region is facing a number of challenges related to the roadway network. Limited options exist for increasing vehicular capacity through the isthmus, with no possibilities for adding general purpose travel lanes. There are also limited options for enhancing the connectivity of the street network in areas developed in the postwar period. One potential opportunity currently being studied is the addition of one or more non-interchange crossings of the Beltline. However, arterial roadway network congestion is still, with the exception of the Beltline, generally reliable and occurs over a short duration.

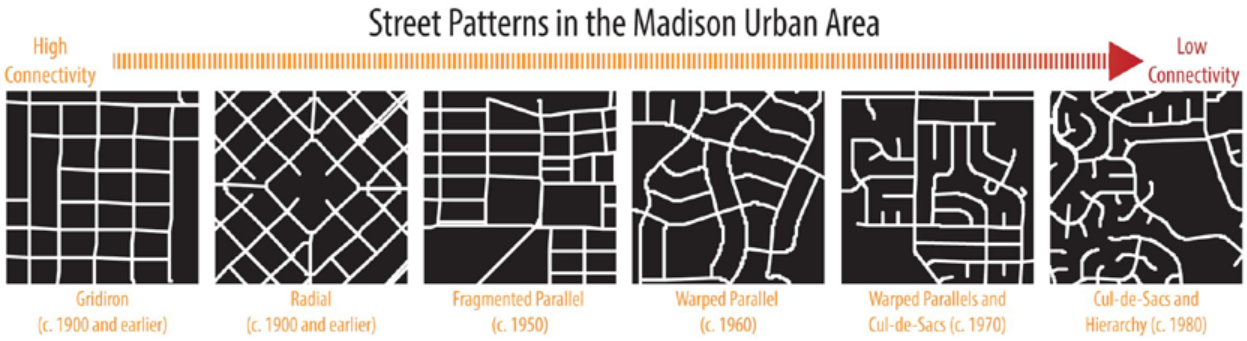
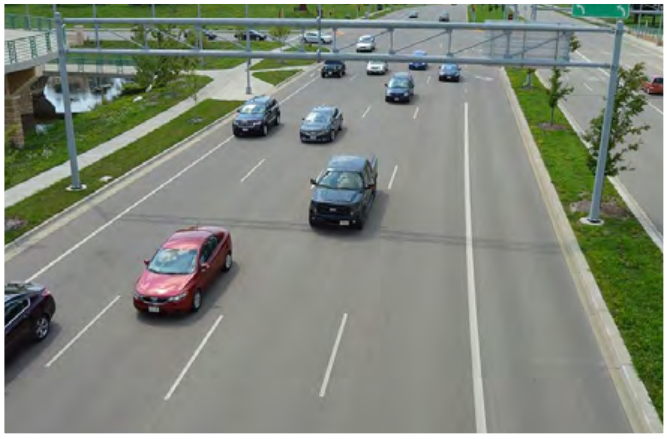


Figure 3-1: Street Patterns in the Madison Urban Area

Roadway Functional Classification System

The Federal-Aid Highway Act of 1973 requires the use of functional highway classification to update and modify the Federal-aid highway system, which includes all regionally significant roadways eligible for federal funding. The functional classification system categorizes highways, roads and streets by the character of service they provide for transportation planning and funding purposes. It defines the role roadways play (mobility, connectivity, accessibility) in serving travel needs and carries expectations about roadway design, including speed, capacity, and relationship to existing and future land use. MATPB and other transportation agencies describe roadway system performance, benchmarks, and targets by functional classification.



Mineral Point Road is an example of an urban principal arterial.

The functional classification system divides roadways into two groups – urban and rural – based upon whether the roadway is located within an urban area. The urban area is defined by the U.S. Census Bureau, and is based upon total population, population density, and large impervious

areas where there is urban non-residential development. The roadway functional classification system makes a distinction between urban and rural roadways because of their differing road network densities and travel patterns.

MATPB coordinates with WisDOT to assign functional classifications to roadways in the urban area, while WisDOT assigns functional classes to roadways in the rural area. Roadways in rural areas must meet certain criteria to be entered into the functional classification system. They must adequately serve the needs of the area population and land uses, be a minimum distance from other classified parallel routes, and must meet several supplemental criteria as well. Roadways within urban areas must meet criteria from these same categories. In addition, the functional classification of roads that cross the urban-rural boundary is generally maintained, to ensure route connectivity.

Figure 3-2, shows the functionally classified roadway system in Dane County as approved in 2015. The map is updated every ten years.

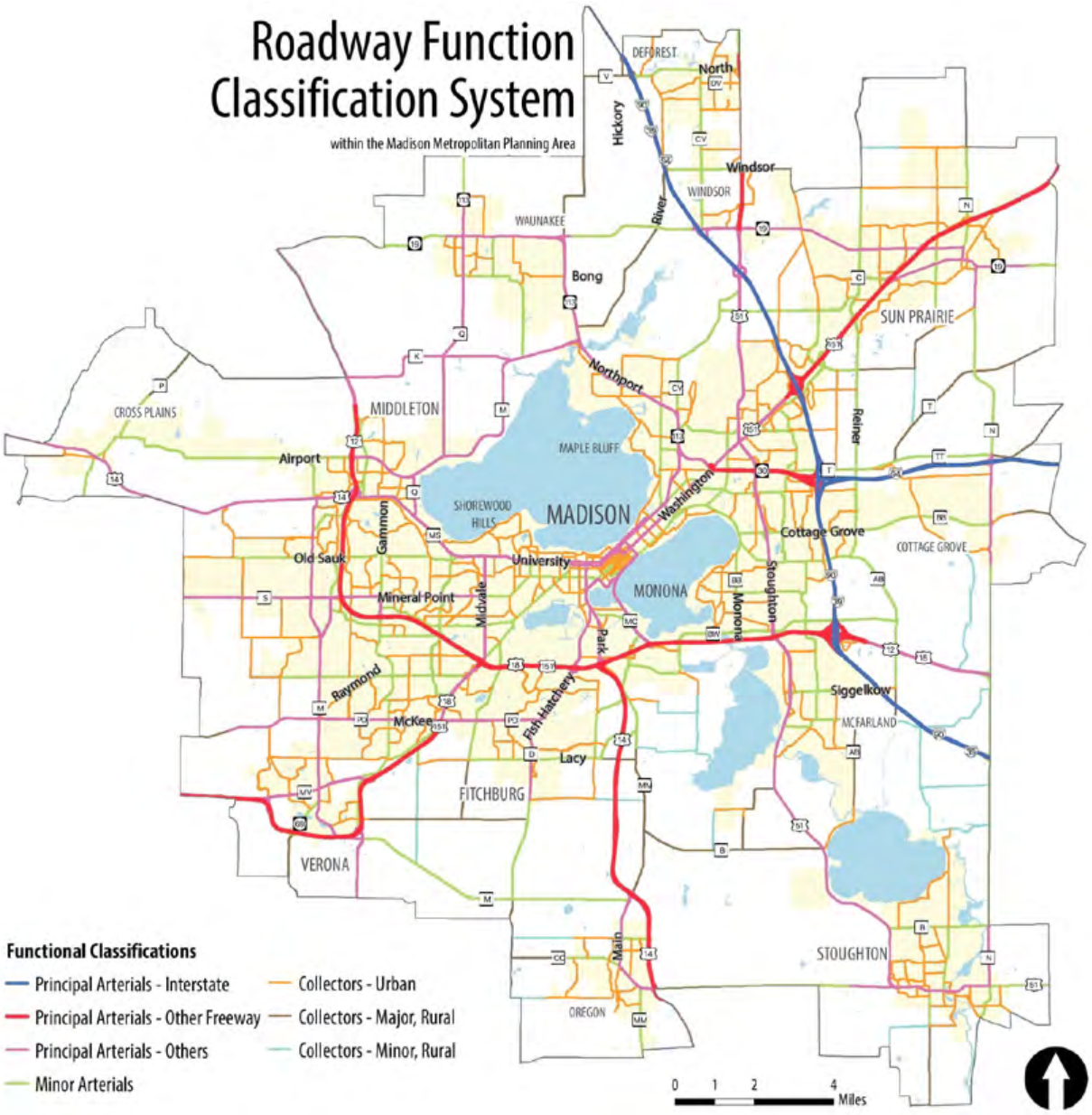


Figure 3-2: Roadway Functional Classification System

Figure 3-3

The Relationship between Functional Classification, Land Uses Served, and Traffic Volumes

Functional Class	Function	Land Use	Volume	Facility Type
Principal Arterials --Interstate	Link major urban areas of the United States. Move inter- and intra regional traffic, particularly long trips in the high traffic volume corridors.	Abutting land uses not directly served. Access and egress points are served by on-and off-ramps.	35,000 to 130,000+	High speed, divided highway with full control of access and grade separated interchanges.
Principal Arterials -Other Freeways	Move inter- and intra regional traffic, particularly long trips in the high traffic volume corridors.	Abutting land uses not directly served. Access and egress points are served by on-and off-ramps.	20,000 to 75,000+	High speed, divided highway with full control of access and grade separated interchanges. May have a very limited number of at-grade intersections.
Principal Arterials - Others	Serve longest trip demands and highest traffic volume corridors, where not served by freeways.	Serve major economic activity centers.	15,000 to 50,000	Typically a divided road with limited or no driveways to specific parcels and at-grade intersections with other roadways.
Minor Arterials	Interconnect with and augment the principal arterial system and provide service for trips of moderate length.	Serve important economic activity centers. Distribute traffic to smaller geographic areas than those served by higher-level arterials, with more emphasis on service to abutting land uses.	6,000 to 20,000	Number of lanes and type of median directly related to traffic volumes and abutting land uses.
Collectors	Connect local streets to the arterial street system.	Serve both residential neighborhoods and commercial/industrial areas; provide access to abutting land uses.	3,000 to 9,000	Typically two-lane streets with more frequent intersections.
Locals	Serve the ends of most trips.	Provide direct access to adjacent land.	100 to 7,500	Typically two-lane streets.

The Federal Functional Classification System divides roadways into four major classes: principal arterials, minor arterials, collectors, and local roadways. Principal arterials are further subdivided into the Interstate system, other freeway, and other (including expressways and signalized local arterial streets), while collectors are subdivided into major and minor in rural areas.

Urban Roadway Functional Classifications[1]

- *Principal Arterial:* Principal arterials serve major economic activity centers of an urban area, the highest average daily traffic (ADT) corridors, and regional and longer intra-urban trips. In every urban area, the longest trips and highest ADT are characteristic of the main entrance and exit routes. Because these routes are generally extensions of the highest rural functional routes, they should be principal arterials. Principal arterial trip lengths are indicative of the rural-oriented traffic entering and exiting the urban area on the rural arterial system, as well as the longest trans-urban area travel demands.

- *Minor Arterial*: Urban minor arterials serve important economic activity centers, have moderate ADT, and serve intercommunity trips interconnecting and augmenting the principal arterial system. Trip lengths are characteristic of the

[1] Highway Functional Classification Concepts, Criteria, and Procedures (FHWA, 2013) and Functional Classification Criteria (WisDOT, April 2013).

rural-oriented traffic entering and exiting the urban area on the rural collector system. In conjunction with principal arterials, minor arterials provide an urban extension of the rural collector system to the primary central business district (CBD) and critical links to satellite community CBDs.

Although the predominant function of minor arterials is traffic mobility, minor arterials serve some local traffic while, providing greater land access than principal arterials. As such, minor arterials may end abruptly at major traffic generators.

- *Collector*: Collectors provide direct access to residential neighborhoods, commercial, and industrial areas, and serve inter-neighborhood trips. As the name implies, these routes collect and distribute traffic between local streets and arterials. In the CBD and similar areas, the collector system may be a part of the street grid.

  Collectors may end abruptly where they penetrate residential neighborhoods and serve isolated traffic generators, but should generally be linked to other collectors and arterials for traffic circulation. The travel mobility and land access functions of collectors are similar, as shown in Figure 3-4.

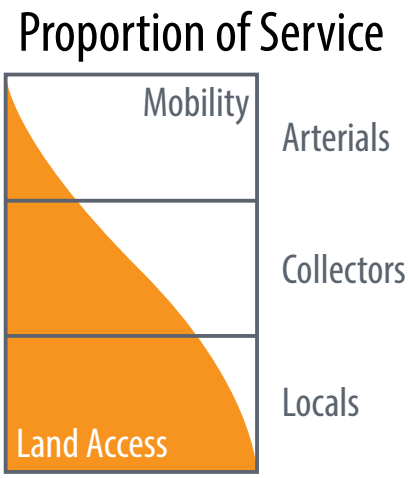


Figure 3-4: Proportion of Service Provided by Roadway Facilities.
Mobility and land accessibility vary according to the three primary functional classes. Arterial roadways provide mostly mobility; locals provide mostly land access; and collectors generally provide an equal amount of travel mobility and land access. (FHWA)

- *Local*: Local streets predominantly serve to provide access adjacent land uses. They serve the ends of most trips. All streets not classified as arterials or collectors are local streets.

Figure 3-5

Characteristics of Roadway Functional Classes

Functional Class	Distance Served and Route Length	Access Points	Speed Limit	Distance Between Routes	Usage	Significance	Number of Lanes
Arterial	Longest	Few	Highest	Longest	Highest	Statewide	More
Collector	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Local	Shortest	Many	Lowest	Shortest	Lowest	Local	Fewer

As state departments of transportation and MPOs continue to move towards a more performance-based management approach, functional classification will be an increasingly important consideration in setting expectations and measuring outcomes for preservation, mobility and safety.

Pavement Condition

Pavement condition management extends the useful life of a roadway and saves money by ensuring roadway preservation work occurs during the most efficient time in the pavement's lifecycle. Extreme pavement degradation can be minimized by performing preservation treatments early in the life-cycle of a roadway mentioned on the next page.

The Pavement Surface Evaluation and Rating (PASER) system is used to assist local communities in evaluating the condition of municipal roadways. The PASER rating system was developed by researchers at the University of Wisconsin-Madison to be a

quick, comparable way to evaluate surface conditions of pavement. The system rates pavements along a scale from 1-10 and prescribes treatment options accordingly, as is described in Figure 3-6.

Figure 3-6

PASER Ratings and Corresponding Treatments

Quality	Rating	Treatment for Pavement	Treatment for Concrete
Excellent	9-10	No maintenance required	No maintenance required
Good	7-8	Crack sealing and minor patching	Routine maintenance
Fair	5-6	Preservation treatments (non-structural)	Surface repairs, partial-depth patching
Poor	3-4	Structural renewal (overlay)	Extensive slab or joint rehabilitation
Very Poor	1-2	Reconstruction	Reconstruction

For state roadways, WisDOT uses the more sophisticated Pavement Condition Index (PCI) to evaluate pavement condition. PCI was developed by the United States Army Corps of Engineers, and uses a visual survey to measure the distress of pavement. This widely utilized method of pavement condition measurement factors in a number of pavement distress types:

- ride quality
- alligator cracking
- bleeding
- block cracking
- bumps and sags
- corrugation
- depression
- edge cracking
- joint reflection cracking
- lane/shoulder drop-off
- longitudinal and transverse cracking
- patching and utility cut patching
- polished aggregate
- potholes
- railroad crossing
- rutting
- shoving
- slippage cracking
- swell
- weathering and raveling

In addition to these pavement distress types, PCI rates distress in jointed concrete pavements. The system rates pavements along a scale of 0-100 in which 0 is the worst possible roadway condition and 100 is a new roadway. For simplicity, this scale has been converted to the PASER scale where used in the RTP.

In general, roadways with a pavement condition of "fair" or worse are nearing the end of their repairable life. Lower volume roads routinely fall into this category, while high-volume, regional mobility corridors rarely do. In 2015, the Madison metropolitan area pavement condition varied by facility type:

- 96% of the interstate highway system is in good condition
- 89% of the US highway system is in fair or better condition
- Roughly 16% of the state highway system is in poor or worse condition
- About 60% of local facilities (arterials, collectors, and local roads) are in good condition and roughly 30% are in fair condition.

Some of the regional roadways in the poorest condition in 2015 include:

- WIS 113 from Kennedy Road to the WIS 19 (fair)
- WIS 113 north of Waunakee to CTH V (very poor to fair)
- WIS 19 from US 12 to Waunakee(very poor to poor)
- US 14 from the Beltline to Cross Plains (very poor to poor)
- The Beltline from the Broadway ramp to the Yahara River Bridge (very poor)
- Park Street from the Beltline north to West Washington Avenue (poor to fair) - *scheduled for concrete and joint repairs in*

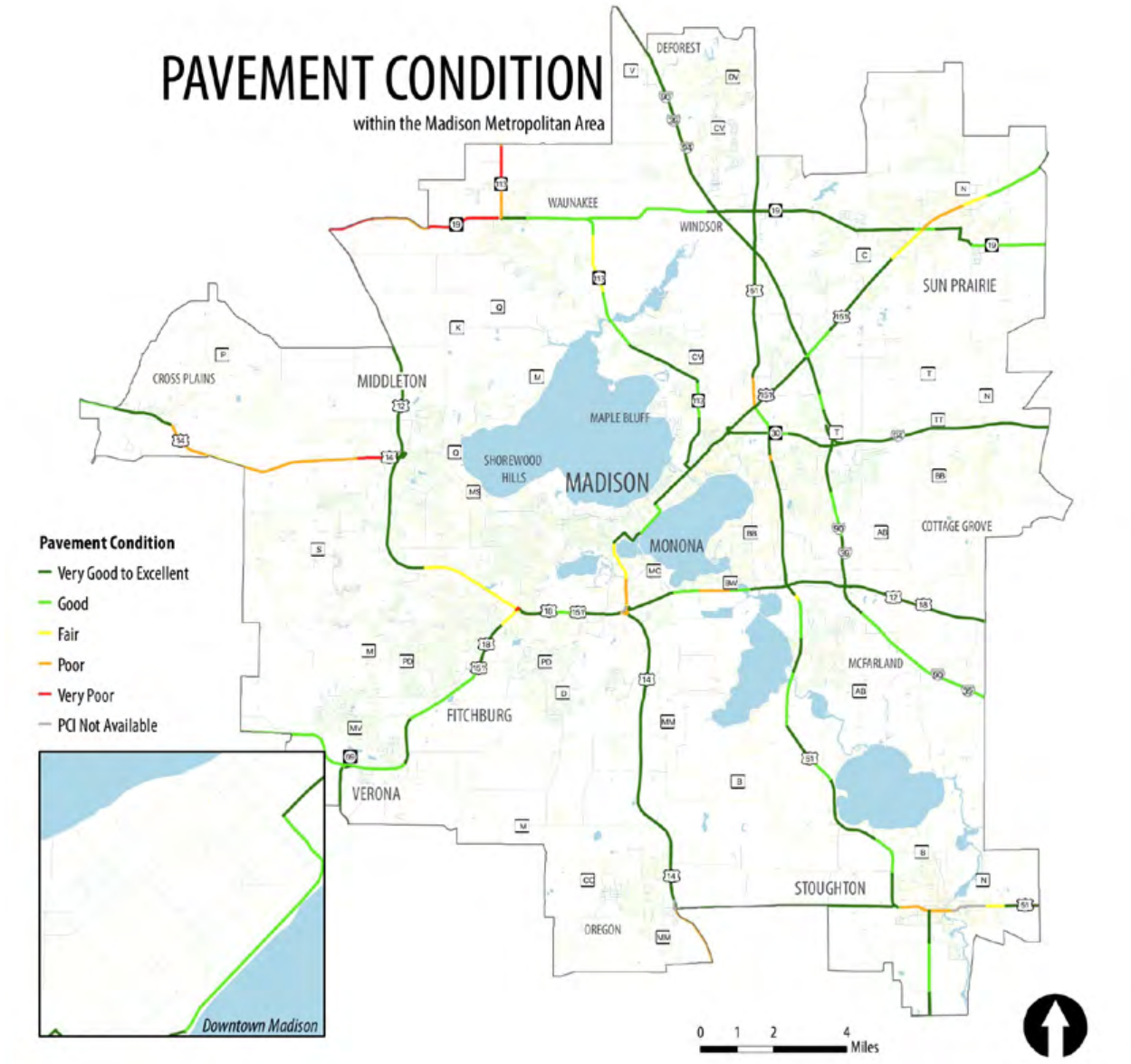


Figure 3-7: Pavement Condition

2019-2020

- US 51 from East Washington Avenue to Pierstorff Street (very poor)
- US 151 in Sun Prairie from the Main Street ramp to the Columbus Street bridge (very poor to poor) - *scheduled for resurfacing in 2018*
- US 14 from WIS 138 to County Highway A (very poor)
- US 51 in Stoughton from WIS 138 to Fourth Street (very poor) - *portion scheduled for resurfacing in 2018*

Some of these regional facilities, such as US 151 and Park Street, are programmed for improvements. Recent trends in roadway condition demonstrate a reduction in the pavement quality of local facilities and an improvement in overall quality of state facilities. Much of this change can be attributed to changes in state-level priorities and funding levels. In recent years, reductions in local roadway funding have led to reductions in local pavement ratings statewide.

Bridge Condition

The Federal Highway Administration (FHWA) compiles the National Bridge Inventory (NBI), a database with information about every bridge and tunnel in the US. As part of this inventory, bridges are given a "sufficiency rating" based on over twenty categories that surmise a bridge's structural condition, obsolescence of its design, and essentialness to the public. A low rating can be earned not only for poor structural conditions, but also for a design that is not adequate for current traffic conditions. Approximately 55% of the rating is derived from the structural evaluation of the bridge, 30% from the obsolescence of its design, and 15% the essentialness to the public.

Bridge sufficiency ratings are a key factor for funding. A sufficiency rating of 80 or less qualifies a bridge for federal repair funding, while a score of 50 or less qualifies a bridge for federal replacement funding. Federally funded bridge projects require a 20% local funding match.

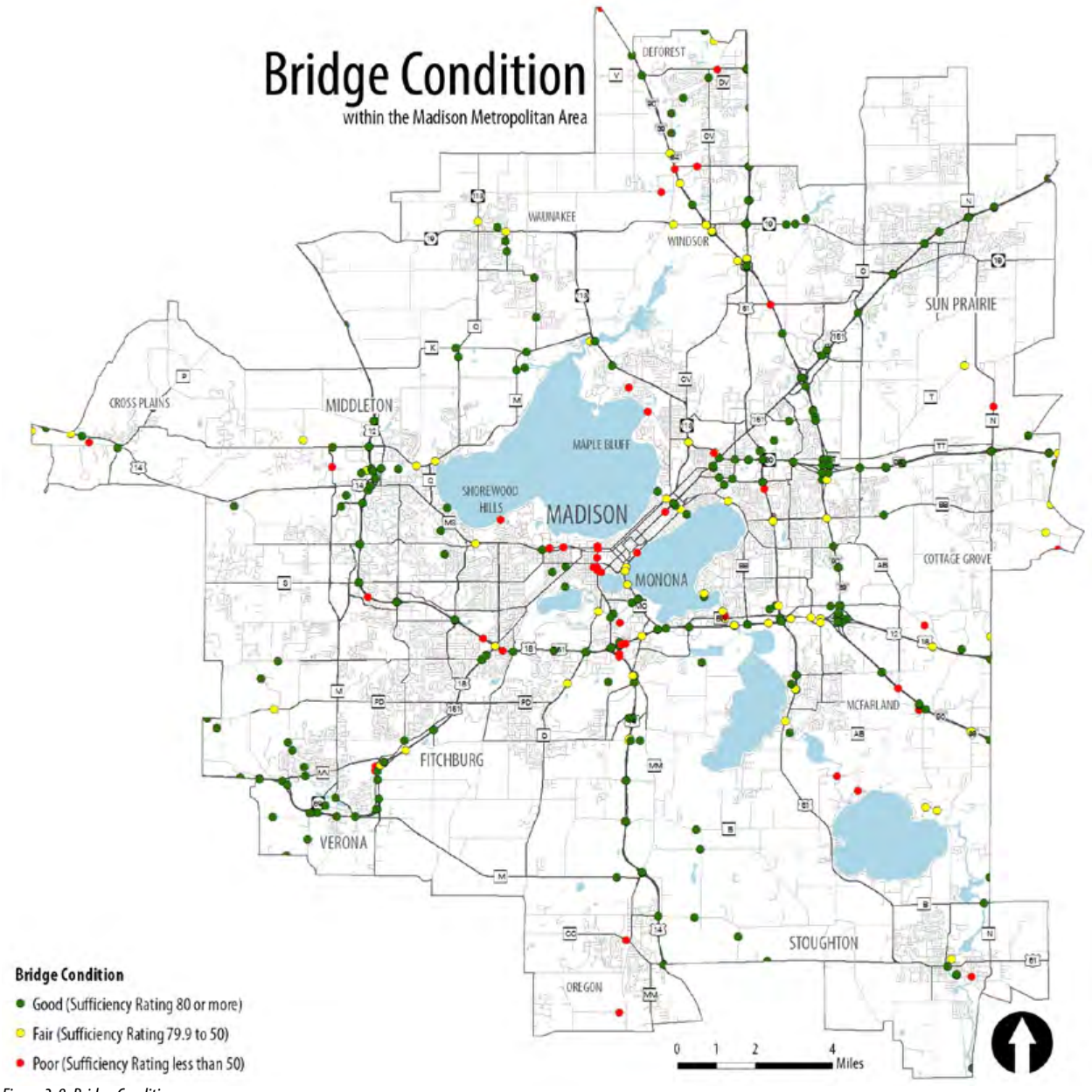


Figure 3-8: Bridge Condition

In the Madison area, 95% of all bridges are in fair or better condition. In fact, 75% of all bridges are in good condition. There are 17 bridges in the region in poor condition including:

- County Highway PB (Badger Mill Creek) - *Scheduled for replacement in 2017*
- County Highway AB (Yahara River)- *Scheduled for replacement in 2019*
- County Highway MN (Door Creek)
- County Highway PD (Badger Mill Creek)
- Windsor Road (Yahara River)
- County Highway N (Koshkonong Creek)
- River Road (I-90/94)- *Scheduled for replacement in 2017*
- WIS 30 westbound (Fair Oaks Avenue)
- Femrite Drive (Door Creek)
- High Point Road (Beltline Highway)- *bridge replacement underway*
- County Highway AB (I-90)
- County Highway KP (Black Earth Creek)



Replacement of the County Road V bridge in DeForest.

Motor Vehicle Safety and Crash Data

The Wisconsin Traffic Operations and Safety (TOPS) lab maintains a database of all reported crashes in the state. Between 2010 and 2014, Dane County experienced an average of 6,817 crashes per year, resulting in a 5-year average crash rate of 140 crashes per 100 million vehicle miles traveled (VMT). During this period there were 154 total crash fatalities (0.63 fatal crashes per 100 million VMT) and 699 crashes resulting in serious injury (3.54 serious injury crashes per 100 million VMT). The number of fatalities remained relatively stable from year to year during the period, while the number of serious injury crashes declined from 195 in 2010 to 145 in 2014. The remaining 96% of crashes resulted in property damage only. In early 2016, the FHWA released rules establishing how to measure the number and rate of fatal and serious injury crashes on the transportation network. MATPB now tracks these measures annually in its Performance Measures Report (Appendix I).

Figure 3-9 shows the location of intersections with high severe crash frequencies. As expected, the highest volume arterials including the Beltline, East Washington Avenue, Stoughton Road (US Highway 51), Mineral Point Road, Verona Road, and Gammon Road have the highest crash frequencies. The 10 intersections with the highest number of severe crashes include:

- Verona Road (US 18/151) and CTH PD
- East Washington Avenue and Thierer Road
- Stoughton Road (US 51) and North Broadway
- East Washington Avenue and 1st Street
- Park Street and Badger Road
- US 12/18 and Millpond Road
- John Nolen Drive and North Shore Drive
- Beltline and the north Whitney Way ramps
- Fish Hatchery Road and Greenway Cross
- University Avenue and Midvale Boulevard

WisDOT identifies road segments on the state system with crash rates that exceed the statewide average for similar roadway types, shown in Figure 3-10. Further analysis is warranted for these segments to determine if there are any potential short-term and/or long-term engineering or traffic control solutions to enhance safety. The West Beltline expansion and Verona Road Interchange reconstruction is expected to improve the safety issues in that area. WisDOT completed a Safety and Operations Study for WIS 19 in 2016, and will be reconstructing the WIS 19/WIS 113 intersection in 2018, and will add two lanes on WIS 19 between River Road and Interstate 39/90/94 in 2020. The Beltline corridor and US 51 are the subject of ongoing major corridor studies which include safety issues as project needs.

The City of Madison Traffic Engineering Division prepares an annual crash report with statistics, maps, charts, and tables summarizing common factors for crashes, high crash locations, historical trends, and other information. This information,



including detailed crash diagrams, is used to assist engineers in planning strategies to reduce crashes and identify possible engineering solutions.

The Dane County Traffic Safety Commission; comprised of staff from the Dane County Highway and Transportation Department, the Dane County Sheriff Department, WisDOT Central and Region Offices, and the State Patrol; meet quarterly to review crash data – particularly fatalities, and to discuss safety issues such as planned projects, research, grant programs, and proposed legislation.

WisDOT's 2014-2016 Strategic Highway Safety Plan is a statewide comprehensive plan that provides a unified framework to reduce traffic fatalities, injuries and crashes over a three year period. The plan examines various highway safety issues in Wisconsin. Additionally, each year WisDOT prepares a report on the programs, grants and activities planned for the next federal fiscal year, which also serves as the state's application for federal safety funds, and submits the plan to the National Highway Transportation Safety Administration. WisDOT administers the federal Highway Safety Improvement Program (HSIP) funds, which can be used for projects that reduce the number and severity of crashes on public roads. This program focuses on infrastructure improvements selected through a data-driven approach, with an emphasis on low-cost treatments that can be implemented quickly.

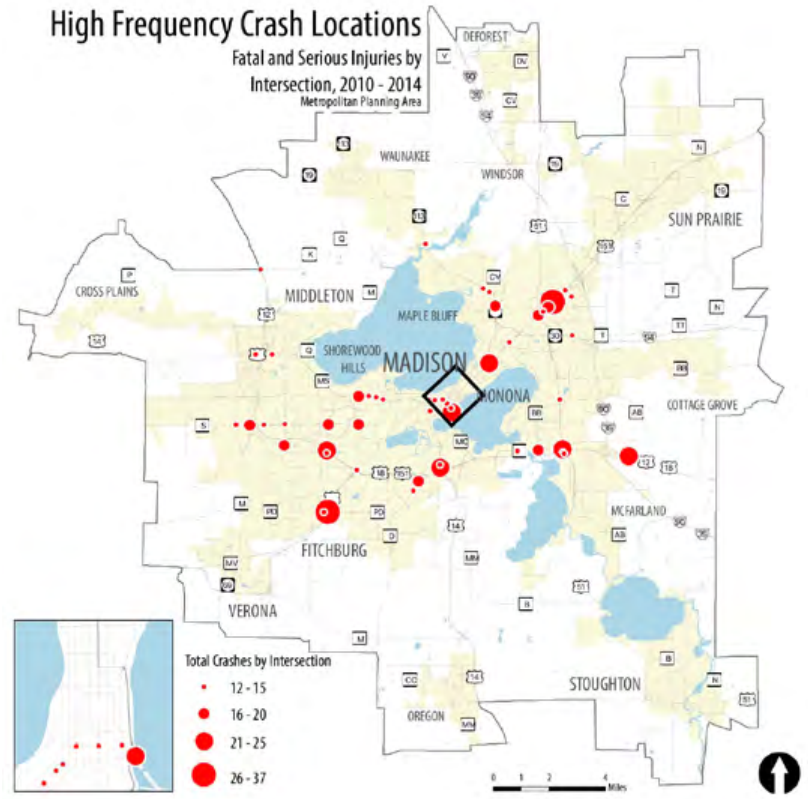


Figure 3-9: High Frequency Crash Locations

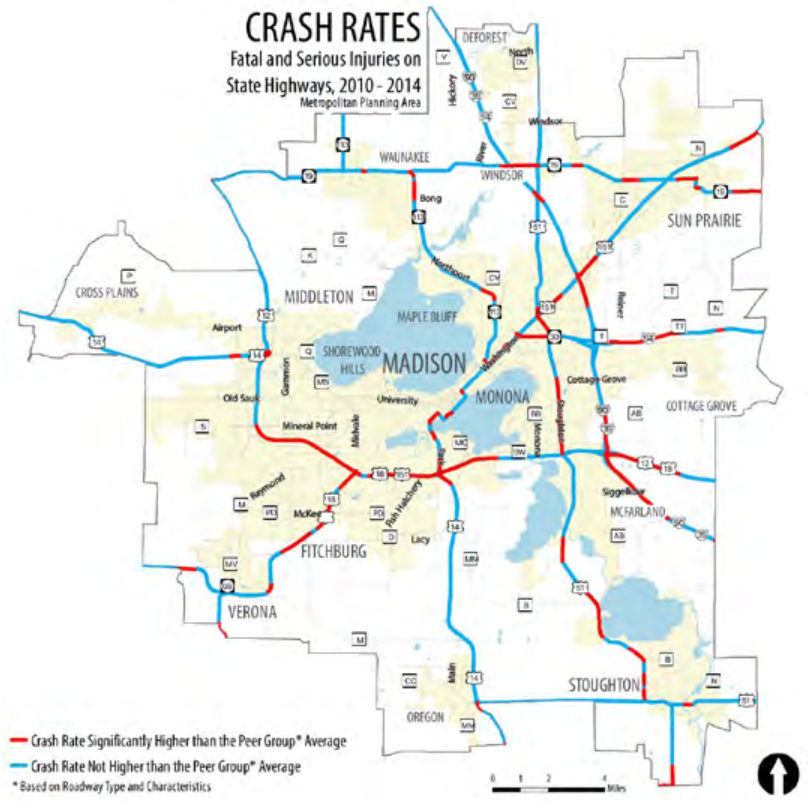


Figure 3-10: Crash Rates on State Highways

Traffic Growth and Congestion

The growth in population and employment in the metro area, combined with an increasing number of commuters from outside the area has led to increasing traffic volumes on the regional roadway system. Following a dip in VMT during the Great Recession starting in 2008, VMT has begun to increase again the past three years. Figure 3-11 provides daily VMT estimates for Dane County from 2000 to 2015. VMT increased on average 0.6% per year during this time period. Average daily car travel per person declined by about 10 percent during this period, falling from 29 to 26 VMT per day. National data shows per capita VMT beginning to rise again since 2014 with miles traveled among those 16 and older about where it was in 1998.

Figure 3-11

Estimated Daily VMT for Dane County

Year	VMT	Change from Previous Year
2000	12,497,100	-
2001	12,636,700	1.1%
2002	13,202,000	4.5%
2003	13,256,000	0.4%
2004	13,450,000	1.5%
2005	13,346,300	-0.8%
2006	13,621,900	2.1%
2007	13,561,000	-0.4%
2008	12,993,400	-4.2%
2009	13,214,200	1.7%
2010	13,258,300	0.3%
2011	13,116,500	-1.1%
2012	13,724,431	4.6%
2013	13,291,000	-3.2%
2014	13,481,513	1.4%
2015	13,637,621	1.2%

Figure 3-12 shows average weekday traffic (AWT) volume on the arterial roadway network in 2013, while Figure 3-13 shows the AWT volume change from 1992 to 2013.

The most significant traffic growth over this time period occurred on the Beltline between Verona Road and I-39/90 and on I-39/90 between the Beltline and US 151. AWT volumes on these roadways increased more than 30,000 per day. The Beltline is the only centrally-located roadway that directly connects the west and east sides of the metropolitan area. According to data collected for WisDOT's Beltline study, over one-half of all vehicles that use the Beltline, exit after passing four interchanges or less.

Traffic volumes also grew significantly on radial arterials outside of the Beltline and Interstate system. This includes US 18/151 (Verona Road), US 14, CTH S (Mineral Point Road), and CTH M (S.









Pleasant View Road). CTH K and WIS 19, circumferential routes on the north side, also saw significant traffic growth. Recently completed and programmed projects have or will be addressing capacity issues on US 18/151, including its interchange with the Beltline, CTH S (Mineral Point Road), and CTH M (S. Pleasant View Road). An existing bottleneck at the US 12/CTH K intersection was addressed in 2015. The intersection of CTH M and CTH K also experiences significant peak hour traffic congestion and needs improvement.

Traffic growth has also occurred on some of the radial arterials inside the Beltline, including WIS 30, East Washington Avenue, University Avenue, and Park Street. Volumes on other radial arterials in the central area, such as Monroe Street, Regent Street, and Johnson/Gorham have remained fairly consistent over the 1992 to 2013 time period, but can fluctuate from year-to-year. Traffic has remained steady in part because the downtown/ isthmus area has not seen much growth in employment compared to peripheral employment centers. Additionally, these arterial roadways through the downtown/ isthmus area are near capacity during peak commute times. Therefore, drivers are choosing alternative routes either south or north around the lakes for cross town trips.

According to travel data collected for the Beltline Study, during the weekday a.m. peak period only 10-20% of traffic traveling in the downtown/isthmus does not have an origin or destination there.

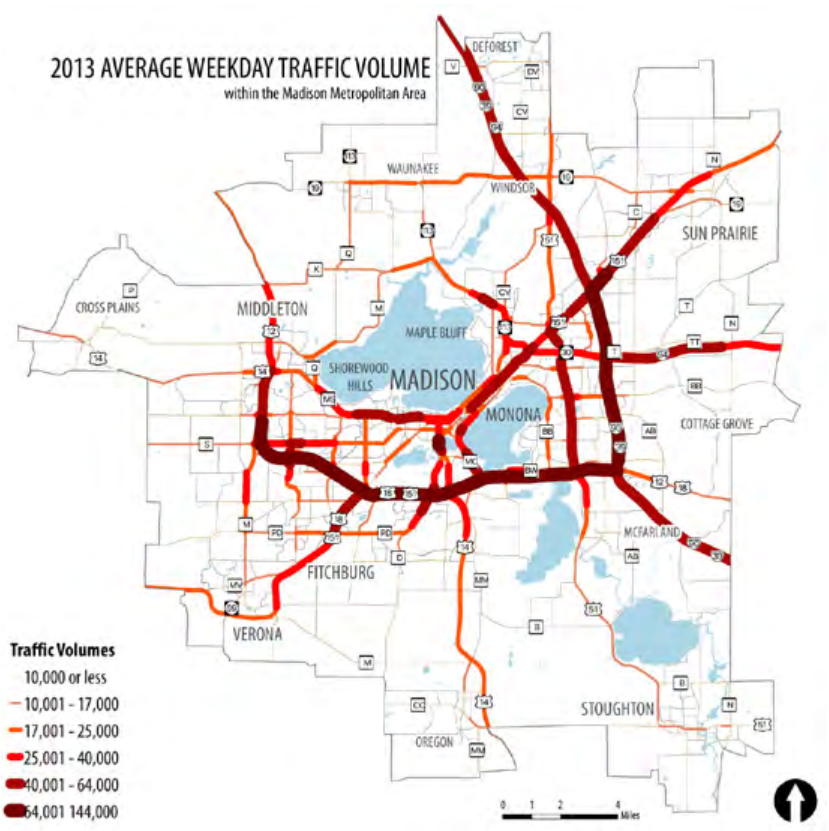


Figure 3-12: 2013 Average Weekday Traffic Volume

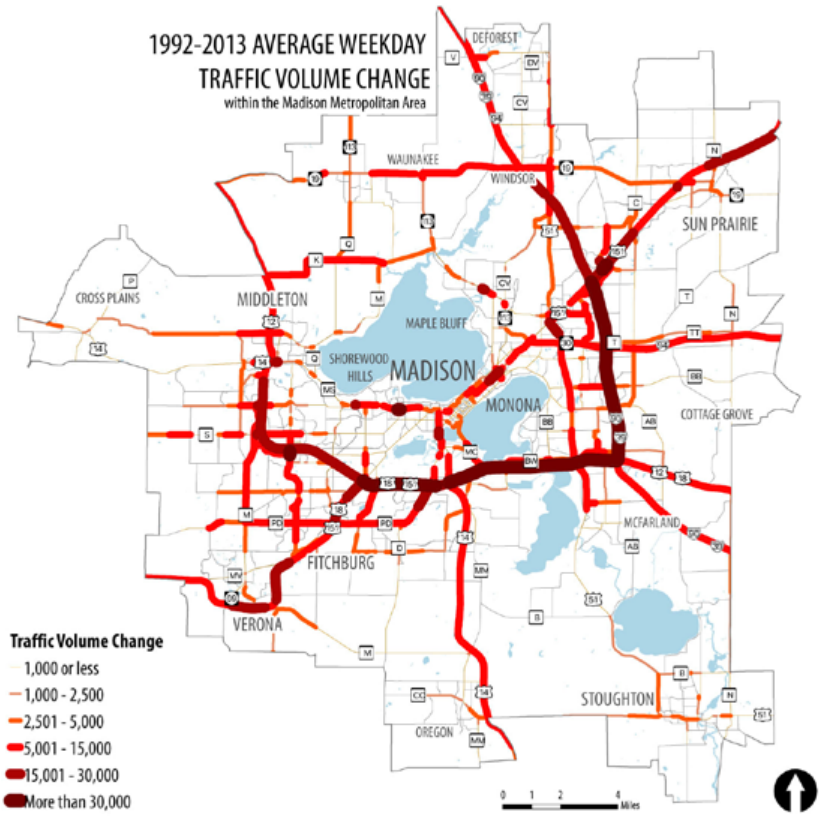


Figure 3-13: 1992-2013 Average Weekday Traffic Volume Change

Congestion Mitigation Strategies

Dane County's roads are busier than ever before. In fact, according to WisDOT's estimate average daily vehicle miles of traveled, or VMT, in the county reached a new high in 2015 of 13.6 million miles. This extra traffic means that the potential for congestion, unreliable commute times, and unsafe roadway conditions is higher than ever.

Roadway congestion is common during the morning and afternoon rush hour periods on heavily traveled regional roadways. Related to congestion is travel time reliability – the variability in travel times that can occur from one day to the next. For most commuters, recurring peak period congestion is understood, anticipated, and planned for.

Drivers generally budget extra time to allow for routine delays, whereas unanticipated variability or delays can be a source of frustration as it can make commuters late for work, cause buses to run late, make business travelers late for appointments or meetings, cause truckers to be charged for late deliveries, and can disrupt the just-in-time delivery process. In many cases, rush hour congestion is difficult or impossible to solve due to physical constraints, costs, and the negative impacts of roadway expansion; however, reliability can be improved through a variety of operational enhancements and incident response management techniques.



The following are the seven commonly accepted sources of congestion that can lead to travel time reliability issues. Capacity limitations of roadways, or physical bottlenecks, only account for, on average, about 40% of the delay.[2]

1. Physical Bottlenecks (40%) – Capacity limitations due to design of motorway
2. Traffic Incidents (25%) – Crashes and accidents that impeding travel lanes
3. Work Zones (10%) – Construction activities that result in physical changes to motorway
4. Weather (15%) - Snow, rain, or other events that change driver behavior and impact flow
5. Traffic Control Devices (5%) – Poorly timed signals, rail crossings, etc.
6. Special Events (5%)– Sporting events, concerts, etc. that cause surges in traffic demand
7. Fluctuations in Normal Traffic – Day-to-day variations that lead to high-demand days

Complicating things, many of these sources of congestion can trigger another source to occur (a weather event causing a crash, a special event making a work zone bottleneck worse, etc.). This means that significant payoffs can be expected by implementing a comprehensive congestion management process (CMP) that includes travel demand management (TDM) and transportation system management (TSM) and operations strategies such as transit and ride-sharing incentives, traffic signal coordination, traveler information, and enhanced incident response, along with physical bottleneck relief through targeted capacity expansion.

[2] https://ops.fhwa.dot.gov/congestion_report/executive_summary.htm

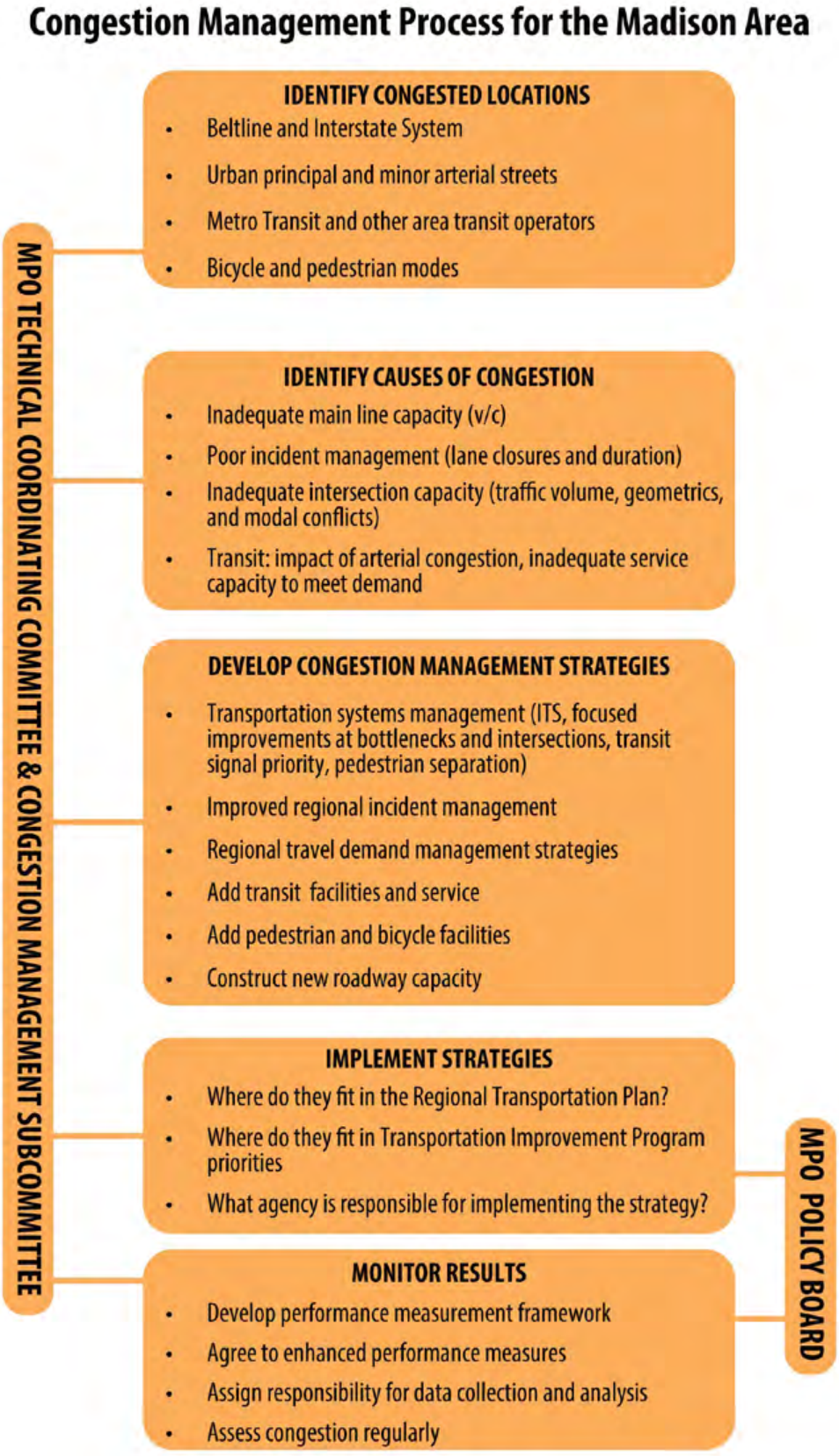


Figure 3-9: Congestion Management Process for the Madison Area

Congestion Management Process

A Congestion Management Process, or CMP, is a systematic process that provides information on transportation system performance and provides alternative strategies to alleviate congestion and enhance the mobility of people and goods. In short, it is a way to get the most out of the existing transportation system. Metropolitan planning organizations are required to maintain a CMP if planning for an area with a population of over 200,000. MATPB adopted its most recent CMP in November 2011.



FHWA says that CMPs must include:

- Methods to monitor and evaluate the performance of the multimodal transportation system, identify the causes of recurring and non-recurring congestion, and identify and evaluate alternative strategies
- Objectives and performance measures to assess the extent of congestion and support the evaluation of the effectiveness of congestion reduction and mobility enhancement strategies for the movement of people and goods that have been deemed acceptable by local transportation officials, the MPO, State DOT
- Establishment of a coordinated program for data collection and system performance monitoring to define the extent and duration of congestion, to contribute in determining the causes of congestion, and evaluate the efficiency and effectiveness of implemented actions
- Identification and evaluation of the anticipated performance and expected benefits of appropriate congestion management strategies that will contribute to the more effective use and improved safety of existing and future transportation systems based on the established performance measures
- Identification of an implementation schedule, implementation responsibilities, and possible funding sources for each strategy (or combination of strategies) proposed for implementation
- Implementation of a process for periodic assessment of the effectiveness of implemented strategies, in terms of the area's established performance measures



Depending upon the need, recommendations for congested corridors can range from implementing better incident management to strategic capacity enhancement. Recommendations will fall into one of three categories: TSM, TDM, or capacity enhancement. The type of recommendation will depend on need, available right of way, land use context, cost, and other considerations. Per MATPB policy, roadway capacity enhancements are generally considered only after implementing both TDM and TSM strategies and not achieving anticipated or desired congestion reduction. A Level of Service (LOS) of D is generally considered acceptable, and service levels lower than that must sometimes be tolerated in certain areas such as downtowns due to right of way constraints and the negative impacts of expanded roadway capacity such as impacts to other roadway users and removal of parking.

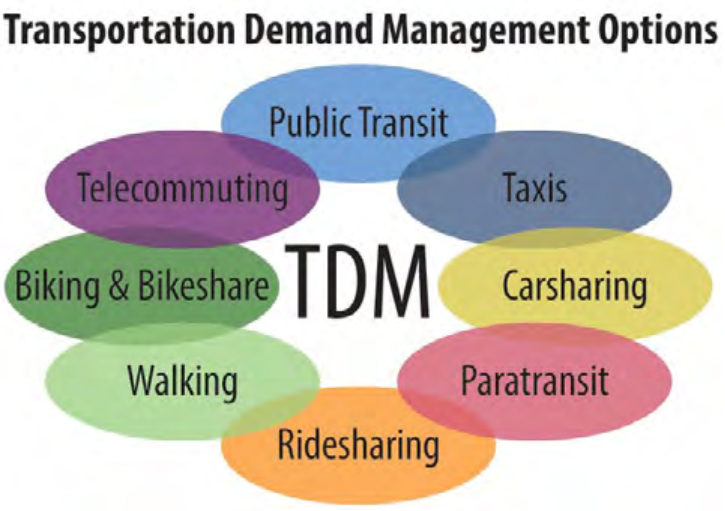


Transportation System Management (TSM)

TSM is a planning tool that focuses on increasing the efficiency of the transportation system by active management of facility operations using technology to minimize the effects of incidents or recurring vehicle congestion. This strategic approach places emphasis on improving existing system efficiency by utilizing intelligent transportation system (ITS) technology to ensure that drivers are aware of incidents, that incidents are attended to rapidly, and that the network responds to sudden fluctuations in driving conditions. This approach also examines and implements future technologies that can improve system efficiency such as connected vehicle technology, coordinated, staged, or adaptive traffic signals, and dynamic message signs. ITS is increasingly becoming a key component of TSM.

Transportation Demand Management (TDM)

TDM is a planning tool that focuses on increasing the number of options for people utilizing the transportation system and incentivizing the use of those options. TDM strategies include increasing awareness and utilization of public transportation, taxis (including app-based services), car sharing, paratransit, ridesharing, vanpooling, carpooling, walking, bike sharing, and telecommuting. Additionally, transportation demand can be managed by adopting land use policies that encourage more compact development with mixed uses and well-connected street networks that can reduce trip length and frequency while providing an environment that is supportive of non-auto modes of travel. More information about TDM, including strategies being implemented by MATPB, can be found on page 3-31.



BICYCLES

Existing Bikeway System

The Madison metropolitan area is served by an interconnected bikeway network, consisting of off-street shared-use paths, on-street bike lanes, and local streets. Bikeway construction began in earnest in the 1990s and most major roadway projects now feature provisions for bicyclists as well as pedestrians. Several rail and other corridors have been utilized to build high quality shared-use paths.

The 2015 Bicycle Transportation Plan organized components of the bikeway system into a regional network of primary and secondary bicycle routes consisting on-street and off-street segments (see Figure 3-14). This network helps planners visualize the bikeway network as it is used by cyclists, identify gaps, and prioritize improvements. The Bicycle Transportation Plan identifies regional bicycle infrastructure needs and outlines recommended regional priority path segments to improve the connectivity of the system and build a truly regional network.

Most communities in Dane County also engage in bikeway planning. The City of Madison has worked cooperatively with MATPB staff to develop and adopt the regional bicycle plan. The Cities of Fitchburg (2017) and Middleton (2009) regularly update their local plans. Other communities including Sun Prairie, Stoughton, McFarland, and Verona have undertaken updated bicycle route mapping and studies to identify and prioritize planned facilities. Local comprehensive and/or recreation and open space plans typically include a bicycle transportation component. The City of Madison also plans for bicycle infrastructure as part of preparation of neighborhood development plans.

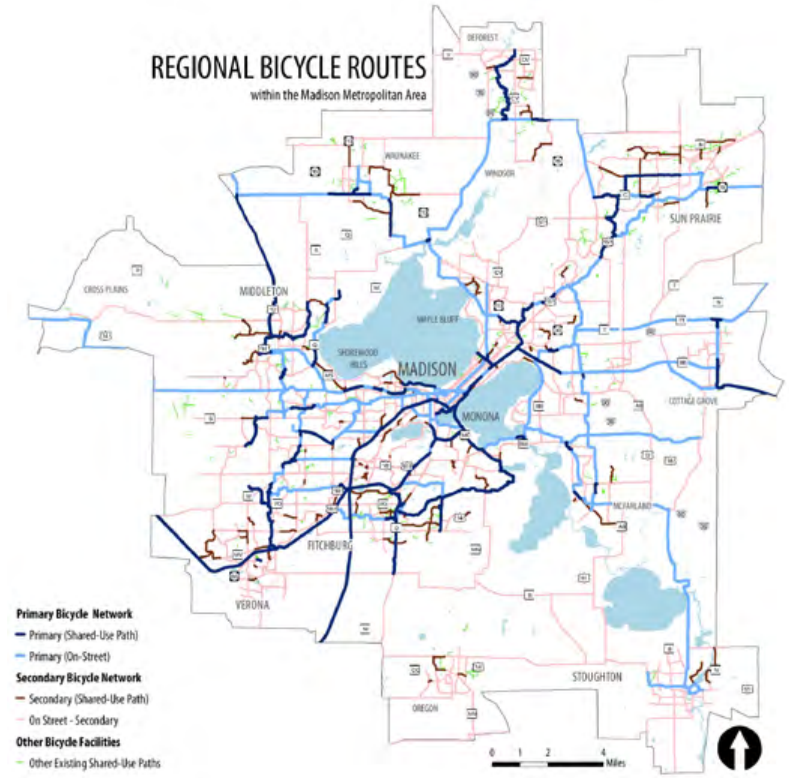


Figure 3-14: Regional Bicycle Routes

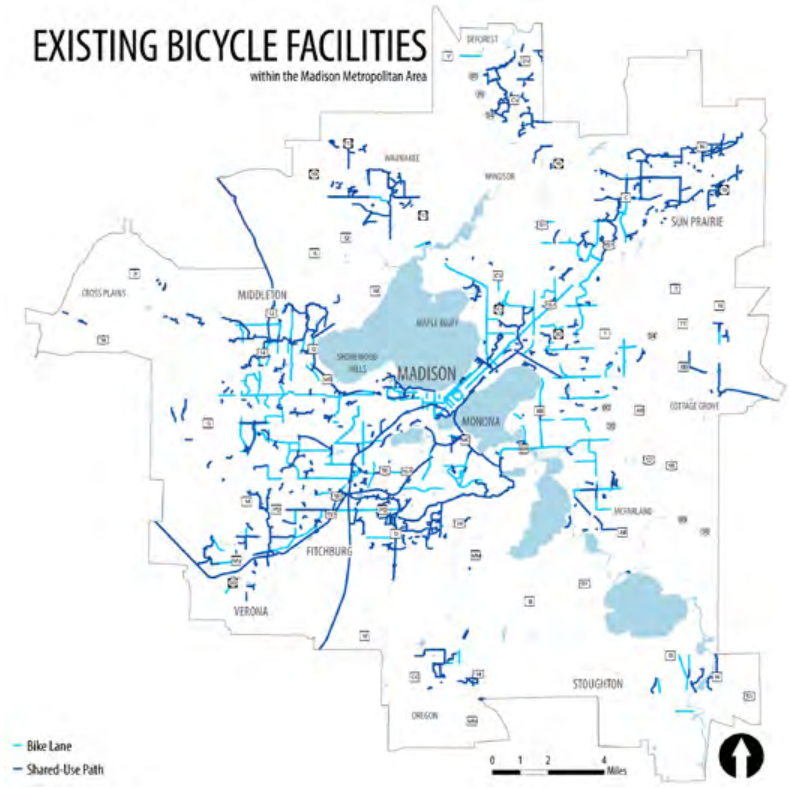


Figure 3-15: Existing Bicycle Facilities

Bicycle Facilities

Bicycle facilities consist of a combination of shared-use paths and on-street facilities such as bike lanes and paved shoulders (in rural areas) and bike boxes and other intersection improvements. Appropriate bicycle facilities are generally included on street corridors as they are reconstructed, if possible. Newer innovative features are now beginning to be added such as separated bicycle lanes and bike signals. Still, gaps in the network persist that make it difficult for cyclists to operate safely and comfortably and access destinations. The 2015 Bicycle Transportation Plan identified several types of bicycle facilities used in the Madison area and around the U.S. Bicycle facilities are chosen based on many factors, including the projected usage, safety design, cost, and available space. Figure 3-15 on page 3-19 shows existing bicycle facilities.

Well-connected street networks are important for bicyclists to navigate within neighborhoods. Most of these streets have no specific bicycle treatments – they are unnecessary because of the low traffic speeds and volumes. In some cases, where continuous low-volume streets are used by high volumes of bicyclists and for longer journeys, they may have bicycle priority features like traffic calming, wayfinding signage, and sharrows.

Dedicated bike lanes are used on arterial and collector streets to separate bicyclists from traffic. They may be separated from traffic with a buffer space or vertical element like a curb or row of parked cars. Counter-flow bike lanes are used on one-way streets to allow two-way bicycle traffic.

Shared-use paths are the most comfortable bicycle facilities because they eliminate the need for a bicyclist to interact with traffic outside of street crossings. Shared-use paths are typically built along existing transportation corridors, through parks, and in other locations where land can be secured. However, they often do not provide direct access to homes and businesses.

Paved shoulders wide enough for bicycle use are used in rural areas where bicycle traffic is relatively low. They operate similarly to bike lanes but also serve as emergency stopping lanes for drivers.

Madison is served by a popular and successful bike-share system operated by BCycle. The system currently operates 350 bikes and 40 docking stations (see Figure 3-16). Stations are centered around central Madison but extend out to University Row (University Avenue at Midvale Boulevard), Monroe Street, the Alliant Energy Center, Olbrich Botanical Gardens, and Madison College's Truax Campus. The service attracted about 101,000 bike trips in 2016.



Figure 3-16: BCycle Stations

Education and Encouragement Programs



Education and encouragement programs help people of all ages, backgrounds, and abilities make use of bicycling infrastructure. These programs help people learn to use the roads and paths safely, and help those who are new to bicycling start riding. Other programs help educate motorists about how to safely interact with bicyclists.

Maps and Wayfinding

The Cities of Madison, Fitchburg, Middleton, and other communities publish local bike maps. MATPB, in partnership with Dane County, publishes the Dane County Bicycle Map, which shows the level of bicycle suitability on rural roadways and highlights suitable through routes connecting communities and major destinations in the county. The Wisconsin Department of Transportation provides bike maps for all counties in Wisconsin.



Historically, shared-use paths and bike routes were named and signed by their controlling jurisdictions. The Dane County Bicycle Wayfinding project established standards for marking bicycle routes to provide consistency across jurisdictions, making it easier and more convenient for cyclists to navigate the system.





Bicycle Usage

Bicycle usage has increased dramatically in the last 15 years or so. The U.S. Census provides reliable commute-to-work bicycle counts that show that about 3.6% of commuters in the Madison Urban Area bike to work. The number rises to 5.5% for commuters residing in the City of Madison and exceeds 10% in some central Madison Census Tracts as shown in Figure 3-17. The increases are largely associated with improved bicycle infrastructure, changing attitudes about transportation and the environment, and the cost and availability of parking in central Madison.

Estimating bicycle usage for non-commute trips is extremely difficult. The City of Madison has several bicycle-counting devices at various locations spread throughout the city that show high usage particularly near the UW-Madison campus and on the Southwest and Capital City Paths. A household travel survey is being conducted in 2016-'17, which will provide data on travel by bicycle and other modes for all trip purposes. The survey will also provide information on factors that prevent people from choosing to make more of their trips by bike, foot, and transit.

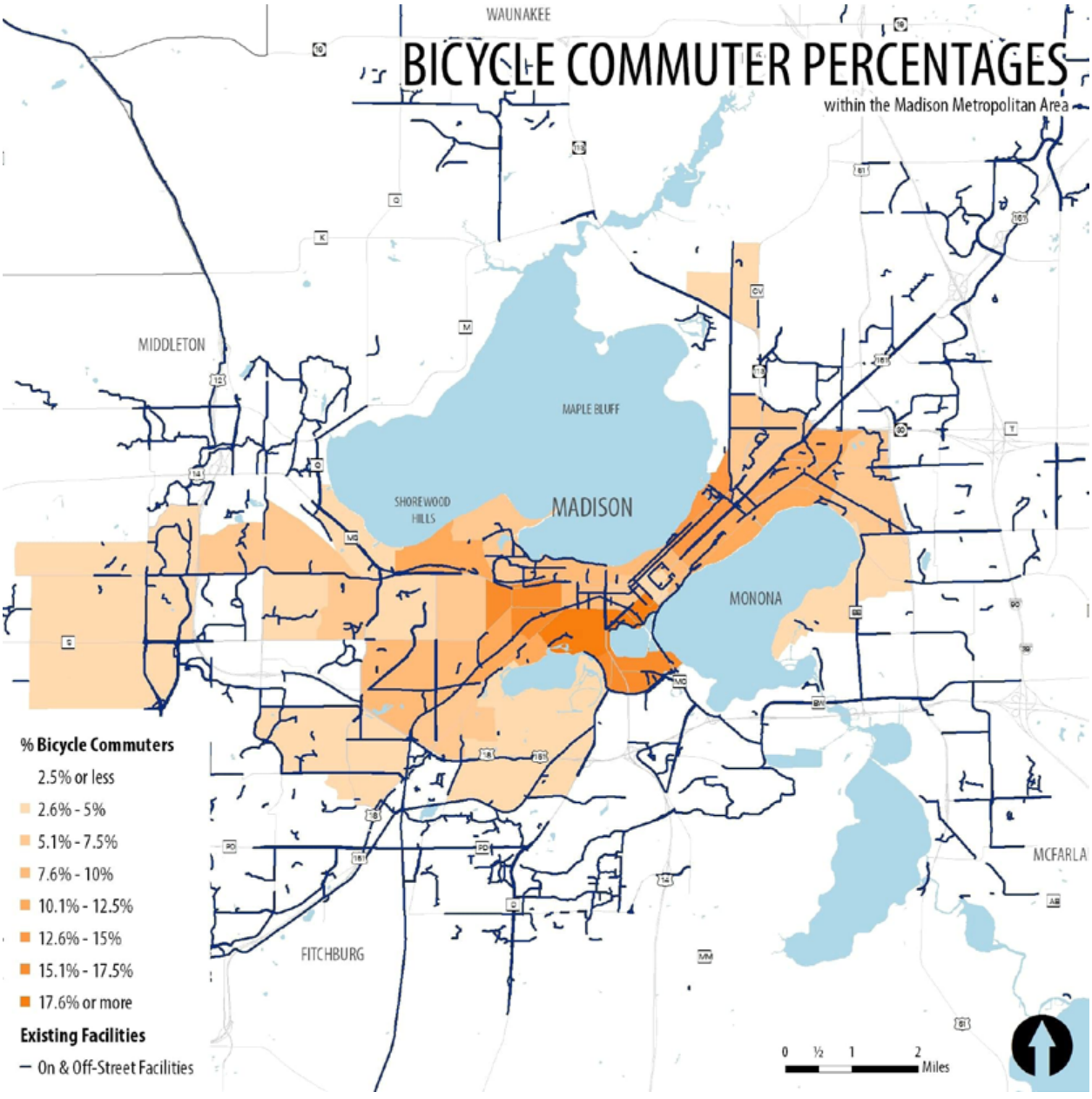


Figure 3-17: Percentage of Commuters Traveling by Bicycle

PEDESTRIANS

Existing Pedestrian System

Pedestrian facilities are important for a safe transportation system that accommodates all users. Sidewalks make walking safer and more pleasant for pedestrians, including the disabled, and provide access to public transit, increasing transportation options for those who may not be able to drive. Having sidewalks on both sides of the street makes walking easier and safer by reducing the number of times pedestrians must cross the street and be exposed to traffic. The City of Madison and other communities have programs that routinely retrofit sidewalks and crosswalks with curb ramps on streets that do not have them and repair sidewalks that are damaged or do not meet modern standards.

All streets benefit from sidewalks. They create a healthier community, as research has shown people will walk more often for recreational purposes if one is provided. Sidewalks, however, are most crucial on urban arterial and collector streets which have higher traffic speeds and volumes and serve more destinations. Sidewalks on these streets provide the most safety benefits and increase the number of transportation trips made by walking. In addition, shared-use paths are also used by pedestrians as an alternative to walking along streets or because they provide shorter routes to destinations.

Intersections represent a special barrier for pedestrians because of the dangers pedestrians face navigating across streets where turning traffic may be passing through the crosswalk and drivers may be focusing on several things at once. Motor vehicle traffic is required to yield to pedestrians at most unsignalized intersections, but compliance is limited.

Sidewalk Coverage

MATPB maintains a county-wide sidewalk database in order to track sidewalk coverage. The database contains information on whether each public street has a sidewalk or shared-use path on both sides, one side, or no sidewalk at all (Figure 3-18). It further tracks whether streets are primarily urban or rural (sidewalks are not normally installed on rural roads) and whether or not a sidewalk is expected, due to existing development and other circumstances. Sidewalks are not normally built on frontage roads, freeways and ramps, and in similar locations.

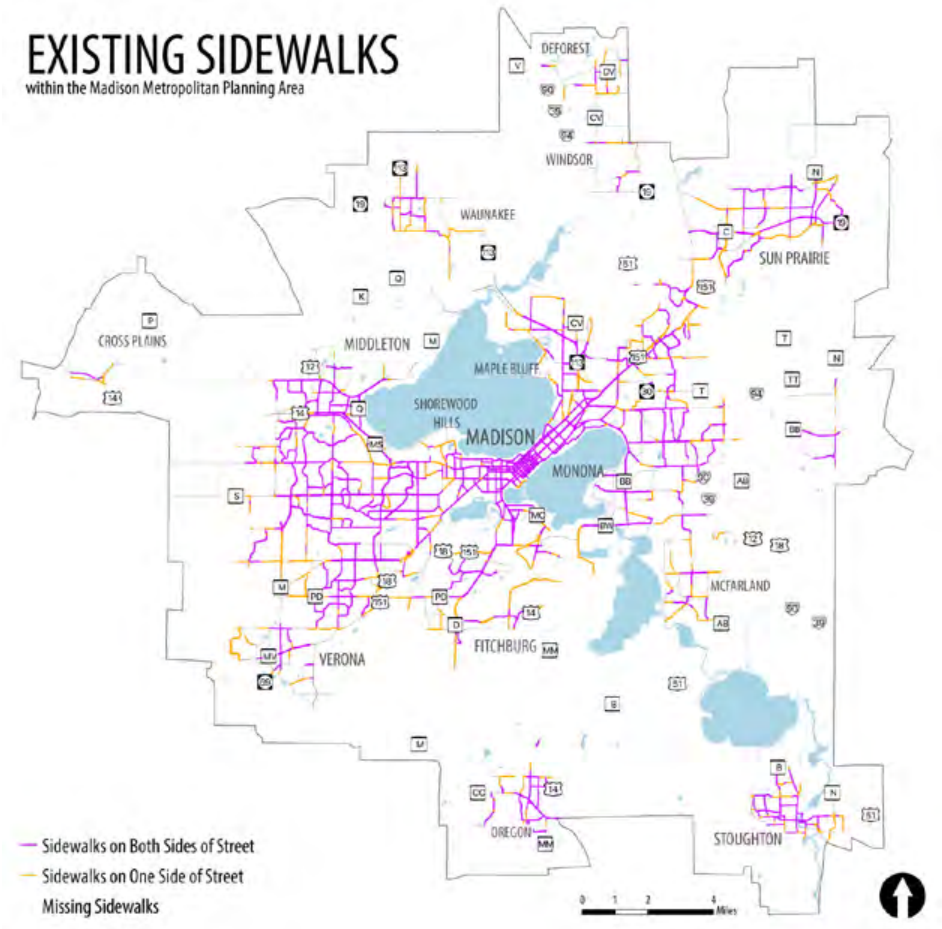


Figure 3-18: Existing Sidewalks

The sidewalk analysis and recommendations in this regional transportation plan focus on collector and arterial streets. In the planning area, about 55% of urban collector and arterial streets by length are estimated to have sidewalks on both sides where they are expected; about 21% have sidewalk on one side, and the remaining 24% have no sidewalk. Many of the urban streets that are missing sidewalk are in peripheral neighborhoods – in some cases sidewalk will be added systematically as the neighborhoods develop.



The Challenges and Trade-Offs with Sidewalks

Although sidewalks are normally included in new construction in most jurisdictions, installing sidewalks along streets in established neighborhoods is sometimes met with local opposition. Residents may be concerned about several issues, including being assessed for the cost of sidewalk installation, the need to clear snow and ice in the winter, and the perceived loss of yard area.

City of Madison residents are charged a special assessment for sidewalk installation and repair. A pilot program was used in 2015 in order to reduce this burden for low-income residents. While it is common for residents or developers to pay a special assessment for the construction of new sidewalks, some municipalities, such as the City of Sun Prairie, do not.

Intersection Treatments

A variety of intersection treatments are used in the Madison area to make intersections safer for pedestrians. Some examples are shown below (see Appendix F for more information on pedestrian facilities and safety treatments).

Marked Crosswalks



Legal crosswalks can be either marked or unmarked. But well marked crosswalks are easier for drivers and pedestrians to see.

Pedestrian hybrid beacons



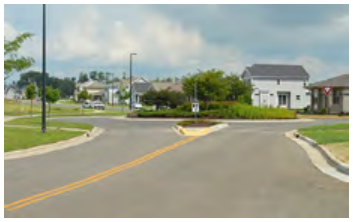
Special traffic signals at an intersection that does not warrant full signalization. The signals are only activated when a pedestrian is present and presses the button.

Rectangular Rapid flashing beacons



Yellow LED lights can, in some cases, be associated with signs at crosswalks to alert drivers at a crosswalk. The lights are activated by a pedestrian.

Median refuge islands



Refuges can shorten distance needed to cross an intersection and allow a pedestrian to make a multi-stage crossing. Refuges should be wide enough to safely accommodate several pedestrians.

Curb extensions



Intersection treatments designed to shorten the effective crossing distance for pedestrians.

Wayfinding signage



In dense commercial areas like downtowns and campuses, wayfinding tools like maps can be valuable for people who are unfamiliar with the area.

Pedestrian Walk Access Analysis

High quality pedestrian facilities are most needed in areas with high population density and a mix of pedestrian-generating land uses like stores, schools, parks, and employment. The pedestrian walk access analysis estimates pedestrian demand using these principles. The analysis counts the number of destinations within walking distance of each Census Block, using a distance-decay function, and assigns each block a destination accessibility score. It then weights the score by Census Block population density, to estimate potential pedestrian demand. Neighborhoods with a high population density and dense mix of walking destinations recieve higher scores. The analysis tool has some limitations as it does not directly account for the attractiveness of the pedestrian environment, such as building orientation, proximity to the street, and other factors. However, it is a useful aid in prioritizing gaps and deficiencies in the pedestrian network. Destinations included in the walk access analysis include:

- Coffee shops, banks, and retail outlets
- Child care centers, schools, and colleges and universities
- Grocery stores
- Restaurants
- Community centers, libraries, and places of worship
- Medical facilities
- Parks

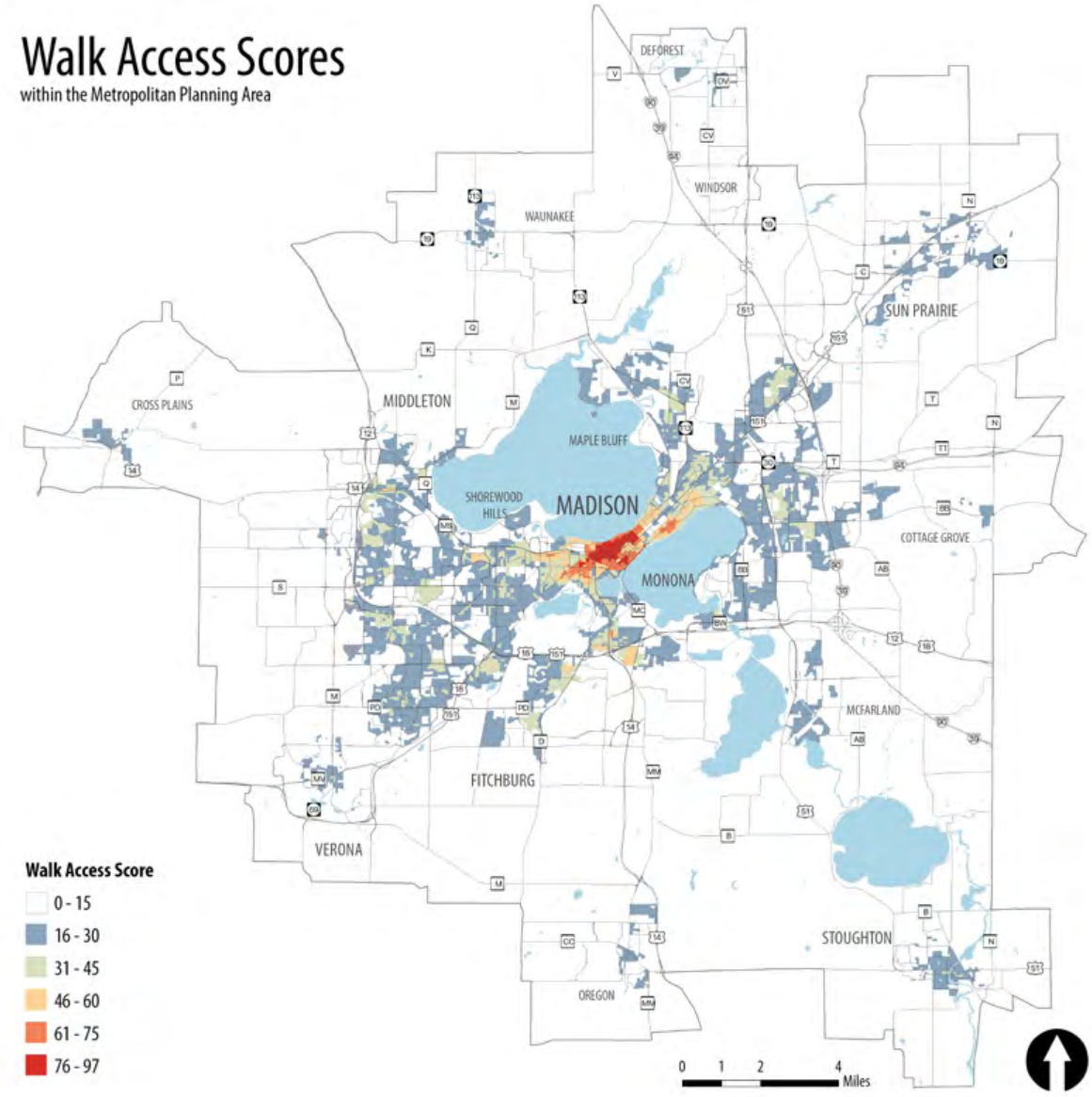


Figure 3-19: Walk Access Scores

Not surprisingly, the central Madison area, including the UW-Madison campus, generates the highest walk access scores. Other mixed-use neighborhoods like Schenk-Atwood, Dudgeon-Monroe, Regent, South Park Street, and suburban downtowns also receive fairly high scores. Many urban neighborhoods have moderate walk access scores, and these areas have regular pedestrian traffic and may have missing connections or substandard facilities.

Street Network Connectivity

Besides high quality pedestrian facilities, pedestrians need a dense network of streets. Since people only walk at a speed of a few miles per hour, any out-of-direction travel is an impediment to walking. Downtown and older neighborhood grid systems with short blocks and dense street networks are ideal for walking.

Intersection density is a key indicator of pedestrian network connectivity. Generally, a higher number of intersections is correlated with shorter blocks and easier navigation. Linear barriers, such as water features, freeways, and railroads also present impediments to walking. Intersection density and linear barriers are shown in Figure 3-20.

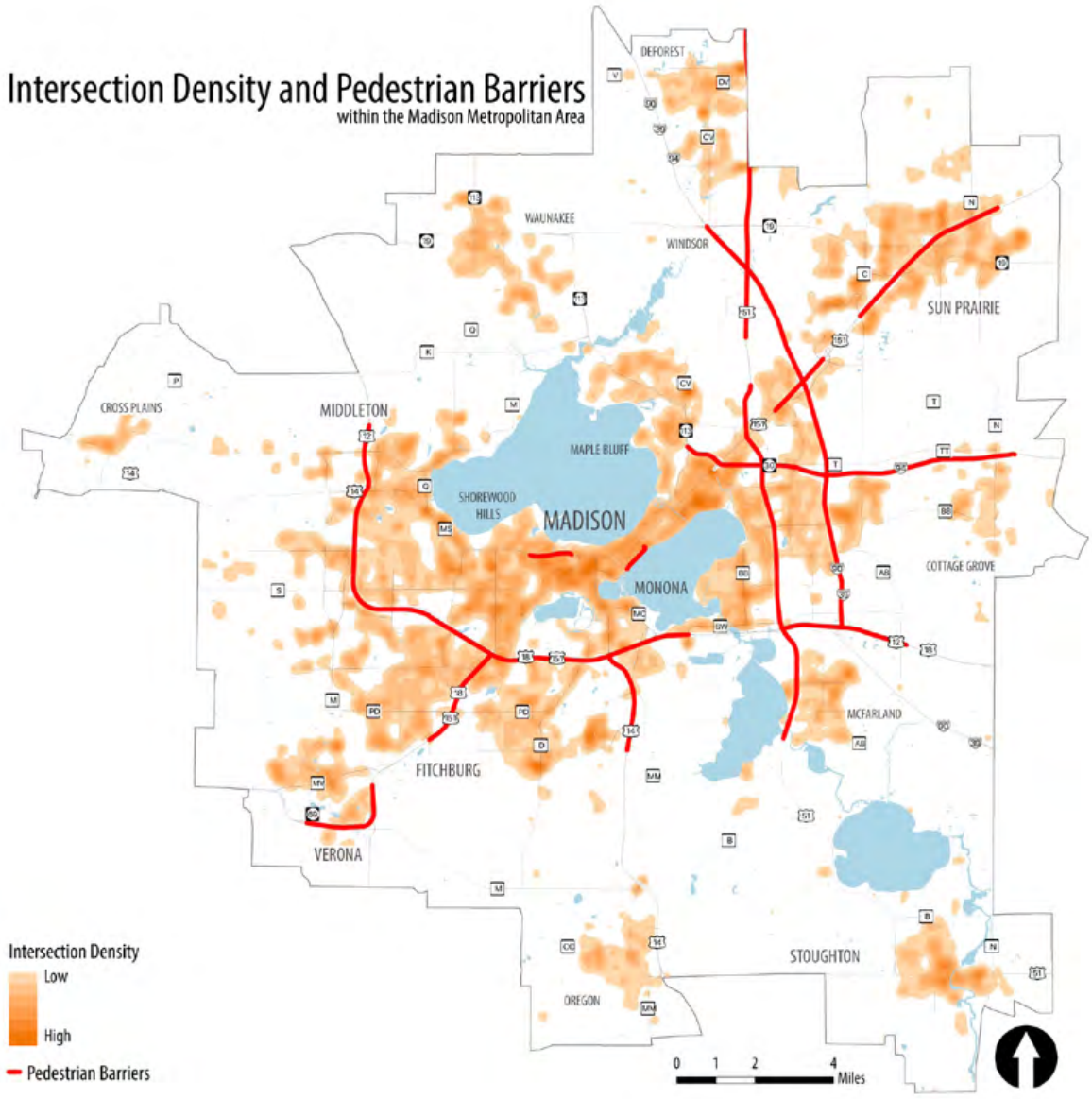


Figure 3-20: Intersection Density and Pedestrian Barriers

The Beltline Highway and Interstate 39/90/94 present significant challenges for connecting neighborhoods. New pedestrian connections across these regional roadways, like new non-interchange crossings, are needed and existing connections may be improved by adding or widening sidewalks and improving intersection crossings at ramp terminals.

All rail lines in the urban area are low volume,low speed lines with relatively frequent crossings. Several rivers and creeks cross the urban area but numerous bridges help to reduce their impact on pedestrian connectivity. For example, the Yahara River contains nine pedestrian crossings in its one-mile stretch between Lakes Mendota and Monona. The City of Madison has identified the need to connect the Capitol Square with Lake Monona with a better crossing of John Nolen Drive and the railroad.

PUBLIC TRANSIT

Service Providers

Metro Transit is operated by the City of Madison and provides the majority of public transportation service in the Madison metropolitan area. Metro operates a fleet of about 215 fixed-route buses as well as point-to-point paratransit service for qualifying people with disabilities. Metro partners with the Cities of Middleton and Fitchburg as well as the University of Wisconsin and other municipalities and entities to provide service outside the City of Madison.

Metro Transit has had an overall trend of increasing ridership since the City of Madison acquired the Madison Bus Company in 1970 as shown in Figure 3-22. The US Oil Crisis of the 1970s caused transit ridership to spike across the nation. Throughout the 1980s ridership declined before reaching a period of moderate growth in the 1990s and fast growth in 2000s. Annual ridership first exceeded 14 million in 2011 and increased further in 2014. Ridership declined in 2015 and 2016. The causes of this recent decline are not entirely clear but may be linked to declining gasoline prices.

In addition to Metro Transit, the City of Monona provides fixed-route commuter service during the morning and afternoon peak periods, called Monona Express, and specialized transportation for seniors and people with disabilities in the mid-day called Monona Lift. Monona Express operates in a counter-clockwise loop around Lake Monona in the morning and a clockwise loop in the evening. Service is only provided to passengers travelling within Monona or between Monona and Madison. Publicly subsidized shared-ride taxi service is available in Sun Prairie and Stoughton.

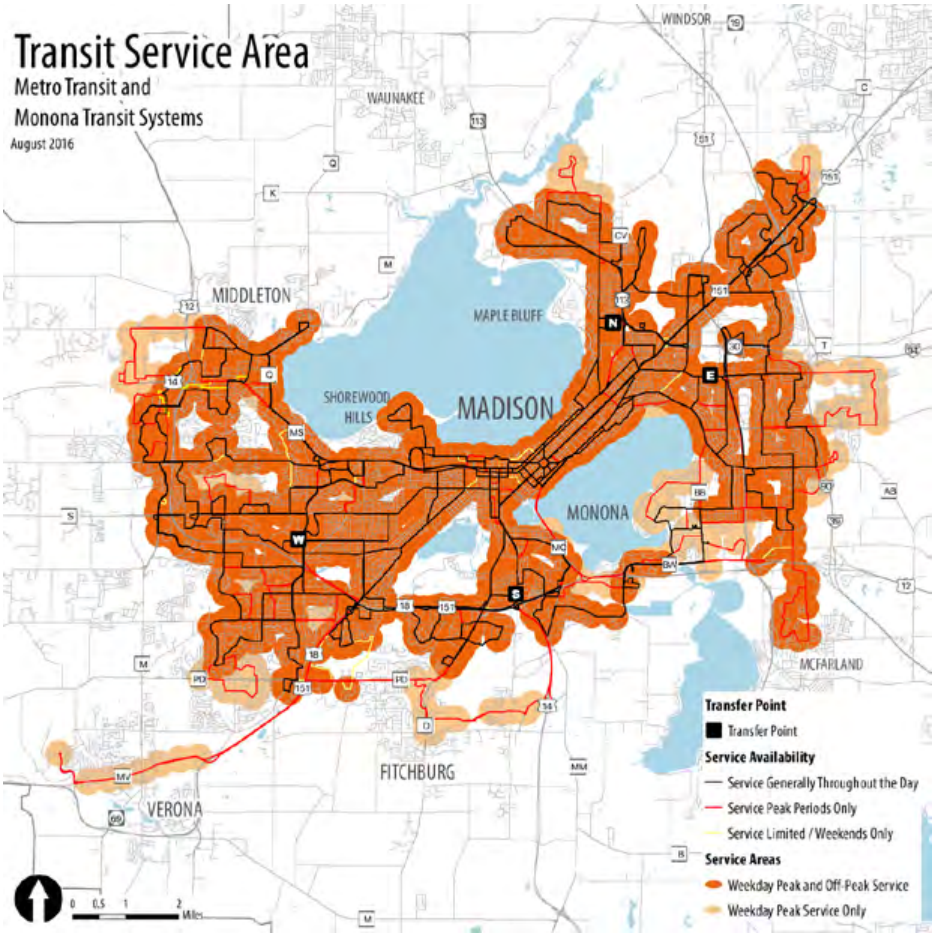


Figure 3-21: Transit Service Areas

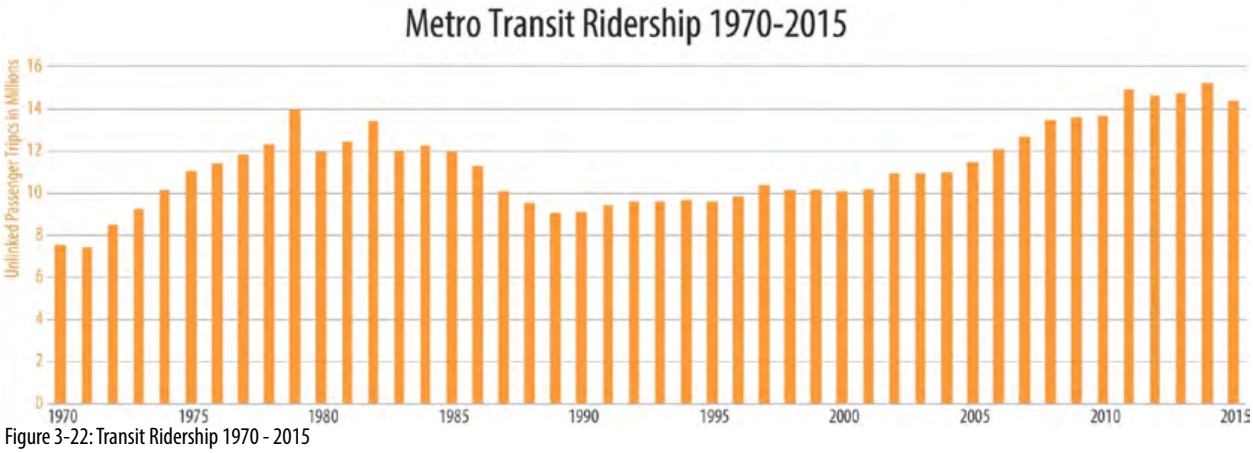


Figure 3-22: Transit Ridership 1970 - 2015

Service Levels

Metro Transit operates 62 mainline fixed routes and several supplemental school day routes based out of Madison's four public high schools. Service is designed around four transfer points with most routes operating every 30 minutes during weekday peak periods and every 30 to 60 minutes off peak if service is offered during those times. Timed transfers at the transfer points allow for efficient connections throughout Metro's service area. Many routes overlap in central Madison to provide service every 15 minutes or better.

Metro Transit's service is concentrated in the morning and afternoon peak periods with about 180 buses in operation during those times. Fleet utilization drops to about 60 buses during the weekday mid day and 35 on weekends. The added service during peak periods consists of increased frequency on all-day routes, commuter routes that provide faster, more direct service and supplemental school day routes targeting middle school and high school students.

Bus Operations

Metro Transit dispatches its fleet of about 215 buses and 17 paratransit vans from a single bus storage and operations facility on East Washington Avenue at Ingersoll Street. The facility was renovated in 1981 with the intent of housing a fleet of about 160 buses and is currently operating beyond capacity. Buses are parked in drive aisles and maintenance bays overnight and Metro leases a small lot in Middleton. Service expansion during peak periods is currently not possible because of the lack of available buses during peak periods.

Metro Transit applied unsuccessfully for a Federal TIGER grant in 2015 and 2016 for funding assistance for a new satellite bus storage and maintenance facility in northeast Madison on Nakoosa Trail. The

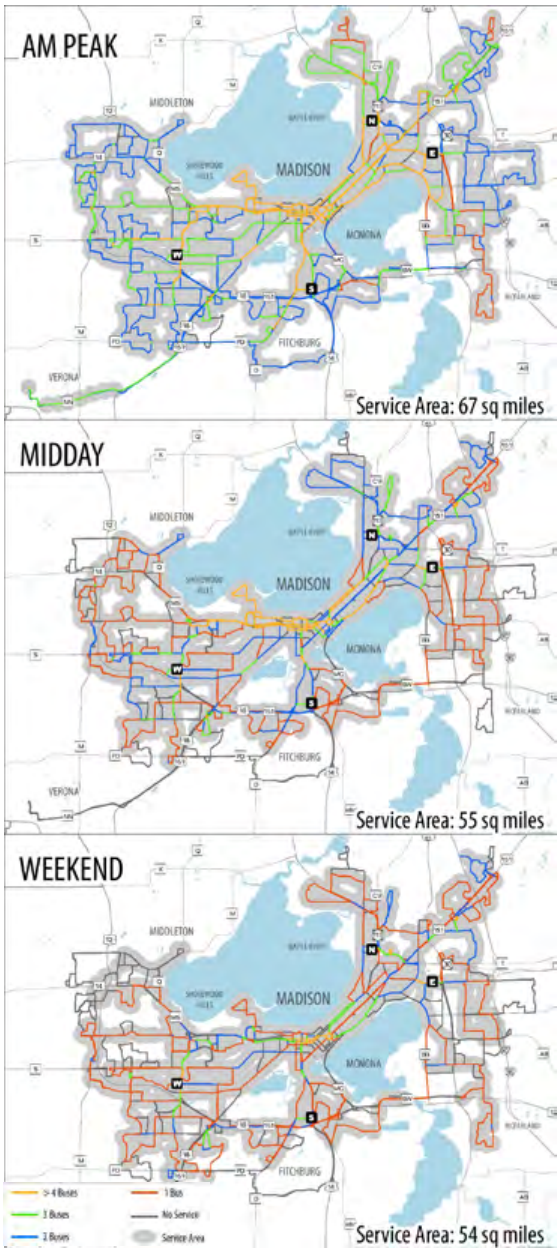


Figure 3-23: Transit Service Areas

new facility would reduce bus crowding at the existing facility and provide space for expansion, allowing Metro to provide new service including bus rapid transit. The Nakoosa Trail facility is planned to be LEED-certified and include a fitness room intended to reduce healthcare costs for bus operators and other employees.

Metro Transit's fixed-route fleet consists entirely of standard-length 40-foot diesel transit buses, about 10% of which are hybrid diesel-electric. Metro Transit, in coordination with MATPB, conducted a Bus Size Study in 2014, reviewing the fleet make-up. The study concluded that although the uniform fleet cost-effectively serves the area, the overcrowding problems encountered on several routes could be solved with larger 60-foot long articulated buses. Further, a few buses could be replaced with shorter 30-foot buses, although the small number of 30-foot buses combined with similar operating costs would not result in large cost savings.



Funding

Funding for public transportation in the Madison area is derived primarily from four sources – fares, property taxes, federal grants, and state operating grants. As Metro Transit is a City of Madison utility, some service, particularly service provided outside the city limits, is funded through partner agreements where other municipalities or institutions cover the local share of the service.

Metro Transit's funding and governance structure as a city-owned utility is fairly uncommon. A Regional Transit Authority which would raise revenue in the transit service area has been explored but is not currently allowed by state law. Enabling legislation was granted in 2009 and rescinded in 2010.

For more information on transit service in the Madison area, see the 2013-2017 Transit Development Plan for the Madison Urban Area prepared by MATPB in cooperation with Metro Transit and other transit providers.

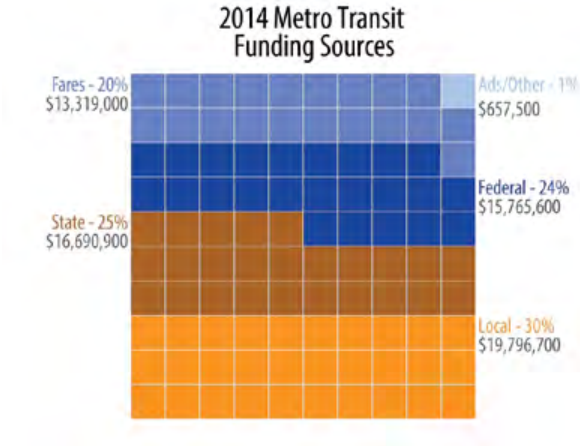


Figure 3-24: 2014 Metro Transit Funding Sources

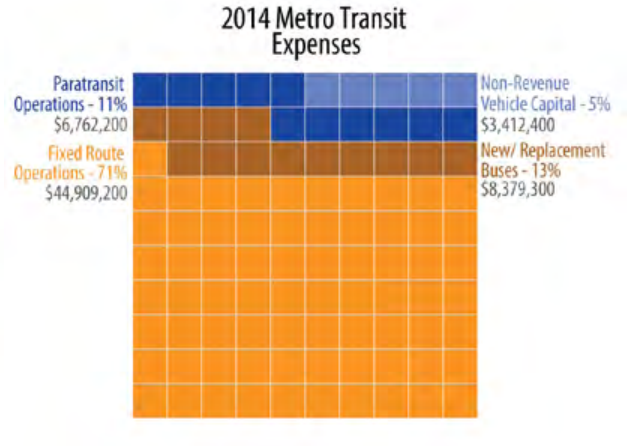


Figure 3-25: 2014 Metro Transit Expenses

Specialized Transit Service Providers

The majority of specialized transit open to the public is supported by Metro Transit and Dane County. A variety of private organizations and service providers help bring the service to the public.



Metro Transit provides its paratransit service, Metro+Plus, in accordance with the Americans with Disabilities Act (ADA). The paratransit network shadows the all-day fixed-route bus system, excluding peak-period commute-oriented service. Paratransit service is provided on a demand-responsive, advance-reservation basis for people who are unable to use Metro's regular fixed-route service.

Metro operates its own paratransit service on weekdays. Late-night and weekend service, as well as weekday service beyond the limitations of the directly operated service, is contracted to private providers. Metro coordinated about 274,000 paratransit trips in 2015 (52,000 directly operated and 222,000 contracted).

The Adult Community Services Division of the Dane County Department of Human Services (DCDHS) administers wheelchair-accessible fixed-route group ride and demand-responsive services for seniors and people with physical or developmental disabilities. The services are provided entirely through contracts with private service providers. DCDHS operates an on-call center to help coordinate these services as well as external resources and to help riders easily connect with the correct service.

The group ride services are divided into Group Access Service, in urban neighborhoods, and the Rural Senior Group Transportation Program, which operates outside of the Madison contiguous area. The services provide regularly scheduled weekday routed group trips for seniors (age 60 and older) and people with disabilities who live at home in Dane County. The service is neighborhood-based, connecting residential areas to nearby nutrition sites, grocery/general shopping areas, and other destinations.

The public shared-ride taxi systems in Sun Prairie and Stoughton offer accessible service that is generally door-to-door. Several private taxi companies operate in the contiguous Madison area; however, only Union Cab offers wheelchair-accessible service.

Other specialized transportation services fill various needs. The Retired Senior Volunteer Driver Escort Program (RSVP) provides individual door-through-door rides primarily to medical appointments for adults aged 60 and over, and for people with disabilities, with volunteer drivers in their own vehicles. The Veterans Helping Veterans program provides veterans and their family members with rides to appointments and services.

For more information on specialized transit services and service needs and coordination issues, see the Dane County Coordinated Public Transit – Human Services Transportation Plan (2013), prepared by MATPB in cooperation with Metro Transit, DCDHS, and other service providers.

TRAVEL DEMAND MANAGEMENT AND RIDESHARING

Travel Demand Management

Travel Demand Management (TDM) is generally defined as a set of strategies designed to reduce roadway congestion and demand for single-occupancy vehicle (SOV) travel by redistributing travel demand to alternative travel modes, times, and routes. TDM programs have typically focused on commuter-based programs such as carpooling, van-pooling, transit, telework, and employer-focused incentive and marketing efforts aimed at reducing SOV trips. TDM programs are now also focusing on active transportation and trips beyond work commutes.

In the Madison metro area, a number of programs and strategies are employed to offer options to commuters. These include the Rideshare, Etc. program, the state-run vanpool program, park and ride lots, public transportation services such as buses, vans and shared-ride taxis, shared vehicles, bicycling, and walking. In addition, strategies to encourage the use of these programs such as the Guaranteed Ride Home program, employer transit pass programs, and promotion programs are also in place.

Rideshare, Etc Program

MATPB administers the Rideshare, Etc program in partnership with WisDOT. The program serves commuters in all of Wisconsin along with the counties in neighboring states. The goal of the program is to reduce congestion and pollution, to provide commuters with more travel options, and to improve quality of life in the communities served. The program includes a website (www.rideshareetc.org) where commuters set up a profile and then can tailor a search to their needs, including a search of potential carpool partners, vanpools, transit routes, and biking partners.

Year	New Commuters Registered
2012	907
2013	919
2014	792
2015	703
2016	676

Figure 3-22: Rideshare Etc. Registrations

As shown in Figure 3-22 in 2016, 676 new commuters registered with Rideshare, Etc for the Dane County area. The number fluctuates each year and the number of registrations is often impacted by the addition of new incentives as well as by rising or decreasing gas prices. However, the total number of commuters in the Madison Metro Area active in the Rideshare, Etc. program is much larger, as many people remain in the system after their initial registration. In 2016 there were 1,866 active participants. In addition, ridesharing arrangements are often formed outside the formal Rideshare, Etc. program and are not captured in these statistics. According to recent Census data, around 8.4% of Dane County residents carpool to work.

State Vanpool Program

Madison is served by a number of vanpools operated by the Wisconsin Department of Administration. The State Vanpool Program serves both state and non-state employees commuting to Madison from outside communities, although each vanpool must have at least one state employee. The vanpools are groups of 7 to 15 commuters traveling together in a passenger van owned and insured by the State Vanpool Program. Passengers share the cost of the trip and pay a fare based on the costs to operate the van. The fare covers gas, insurance and van maintenance. Currently the state operates 70 vanpools commuting to Madison with 920 passengers.



Park and Ride Lots

Currently there are twelve formal park and ride lots in Dane County. Nine are operated by WisDOT, one is jointly operated by WisDOT, Wisconsin Department of Natural Resources and Dane County and two are operated by Metro Transit. Of the park and ride lots, five have transit service:

- North Transfer Point at 1213 Huxley Street
- Dutch Mill Park and Ride on US Highway 51 at US Highway 12/18
- Northside Town Center at Sherman Avenue and Northport Drive
- Verona at 2565 Old County Highway PB
- American Center on East Park Boulevard

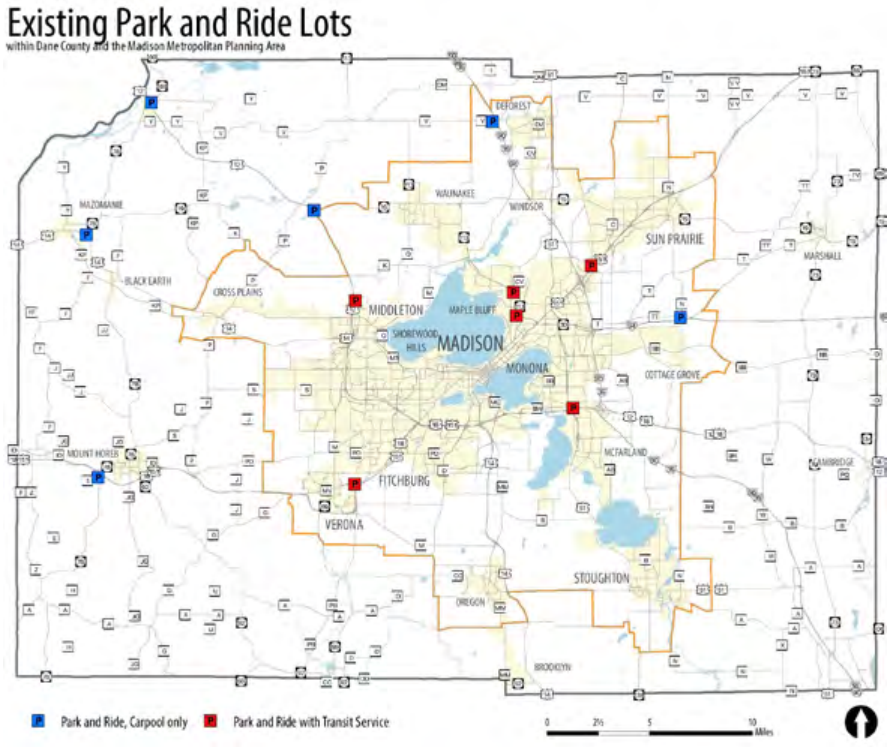


Figure 3-26: Park and Rides

YW Transit & Job Ride Program

YW Transit is a transportation program run by the YWCA that serves Dane County. The three primary goals of the service are as follows:

- Provide rides for low-income people going to/from work
- Provide a safe ride at night for potential victims of sexual assault
- Provide rides to community agency programs for individuals isolated by poverty, age, disability, and language barriers who have no viable transportation options



Source: YWCA

Car Share

Car sharing allows people to access a car for short periods of time, often by the hour. Car sharing makes it easier for people to get by with fewer cars or go car-free, helping members save money while still having access to a car when they need one. Car sharing also provides members with flexibility, since they can access different types of vehicles depending on need. In Madison, car sharing is currently provided by Zip Car. Currently there are 22 Zip Car locations with 32 vehicles which are located on the UW-Madison campus and in the central part of Madison. In the last 12 months the UW-Madison averaged 3,084 members and members used the vehicles for 24,172 hours.

zipcar wheels when you want them

Bike Share



Users of bike share are able to check out a bike at any station, ride to where they need to go, and park the bicycle at the closest station to their destination. People use the bikes to run errands, grab lunch, travel from the bus stop to their office, or just explore the city. The goal is to make it easier for people to make short trips by bicycle.

The City of Madison partners with Trek Bicycles to operate bicycle-sharing through the BCycle program. Currently BCycle operates 40 stations throughout the city with more than 350 bikes. BCycle started with stations primarily on the UW campus and downtown but has been expanding to new areas including stations at Hilldale Shopping Center and Madison College. Many local businesses also partner with BCycle to offer free or low-cost memberships for employees and customers. In 2016 riders took around 101,000 trips covering nearly 308,000 miles and the system averaged just under 300 bike checkouts per day of operation between March 17 and December 31.

Incentive Programs

The Madison area has programs to incentivize commuters to travel by non-SOV modes that are available to all employees. In addition, some businesses have their own incentive systems.

The Guaranteed Ride Home Program supports commuters that do not drive alone to work by providing them with a taxi voucher so they are not stranded at work if an emergency arises. Participants receive up to six vouchers per year good for up to $75 per ride. The program is administered by MATPB and funded by Dane County Highway and Transportation Department. Currently 1,027 people are registered for the Guaranteed Ride Home program.

Metro Transit offers a Commute Card program that is open to employers of any size and offers a reduced price per ride to encourage commuting by bus. The employer can choose to pay the entire cost, share the cost, or have each employee pay for their own rides. Currently 121 employers participate in the program. Large employers such as UW-Madison, City of Madison, Dane County, Edgewood College UW Hospital, Meriter Hospital and St. Mary's Hospital subsidize all or most of the expenses of the Commute Card program for their employees. In addition, a few smaller employers such as Filament Game and the Edgewater Hotel cover the cost of their employees' passes.

Encouragement Programs

To ensure that people are aware of their transportation options and to increase the use of new walking and cycling infrastructure, transit and other services, TDM programs rely on encouragement and education campaigns.

Each year MATPB collaborates with Metro Transit, UW-Madison Transportation Services, and Dane County to run an advertising campaign aimed at raising awareness of commuter options. The campaign usually includes a mix of bus tail ads, online ads, print ads and occasional radio ads.

In addition, Rideshare, Etc. partners with businesses to do outreach through participation in resource fairs and other workplace events as well as providing maps, brochures and other information for businesses to share. Rideshare, Etc. also works with

Sustain Dane to support businesses enrolled in the MPower sustainability program to include TDM projects as a part of their sustainability efforts.

A number of efforts in the Madison area are also focused specifically on promoting bicycling. Many communities participate in the Wisconsin Bicycle Federation-sponsored Bike Week which is held annually in June, and is an expansion of the traditional Bike to Work Day.

One of the newest bicycle promotion programs is the Love to Ride Madison bicycle challenge. This month-long challenge provides messaging tailored to a person's riding experience and encourages experienced bicyclists to get their co-workers and friends out on rides. The ultimate goal of the month-long challenge is to get more people to bike to work and school. The behavior change model recognizes that people are not likely to go straight from never riding a bike to riding one to work. Instead, they are likely to begin with a recreational trip on the weekend and then, once they get comfortable on a bike, move on to cycling on an easy errand before they try commuting to work.

In addition, the Safe Routes to School movement focuses on getting parents and children to walk and bike to school, as children being driven to school creates congestion and safety concerns. Safe Routes to School programs exist in schools throughout Dane County to promote walking and bicycling to and from school. Starting in 2017 a coordinated county-wide program will begin with Federal Transportation Alternatives Program funding provided by MATPB.





UW-Madison Commuter Solutions Program

UW-Madison has a comprehensive TDM program, with a staff that includes a Program Manager, a Ped/Bike Coordinator, and a Flex Parking/Transit Coordinator. The UW Commuter Solutions program UW-Madison TDM activities include:

- Promoting Transit: UW-Madison provides free campus bus service and contracts with Metro Transit to provide a Commute Card for both faculty/staff and students.
- Supporting Carpooling: The UW offers 6 daily parking passes at no cost for registered carpool members as an added incentive.
- Park and Ride: The UW offers park and ride lots for faculty and staff including one at Wingra Dr. and one at University Crossing that have a shuttle to campus. The UW also has a park and ride lot at University Research Park that is served by Metro Transit.
- Occasional Parking for non-SOV commuters: The Flex Parking program provides occasional parking to people who normally commute by alternate modes.
- Supporting Bicycling: The UW provides bicycle parking throughout campus, with bike lockers and cages for more secure parking. The UW also runs a Bicycle Resource Center that offers free use of tools and classes on maintenance and repair for students and employees.

INTER-REGIONAL TRAVEL

Inter-City Bus Service

A handful of private inter-city bus companies provide regularly-scheduled bus service between Madison and Milwaukee, Chicago, and other cities, as well as points in between. Badger Bus provides eight round trips per day to Milwaukee with stops in Johnson Creek and Waukesha, and Van Galder provides more than 12 round trips daily to Chicago with stops in Janesville, Beloit, and Rockford. Megabus and Greyhound provide several daily express trips to Chicago and the Twin Cities.

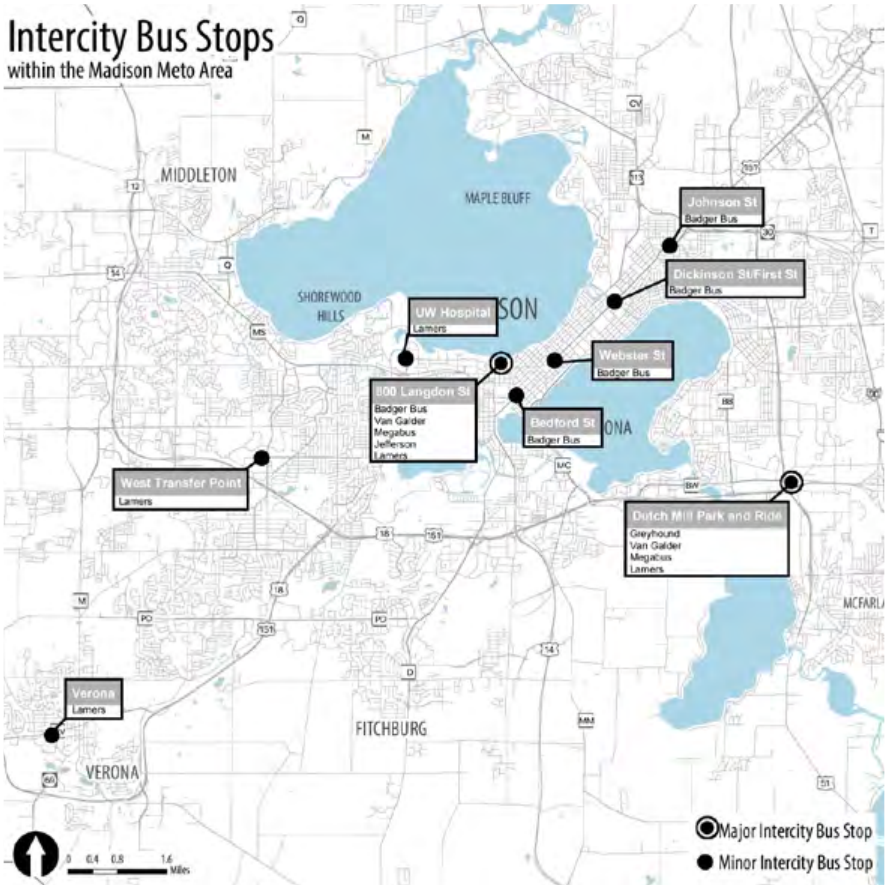


Figure 3-27: Intercity Bus Stops

Lower-volume routes connect Madison to smaller cities. Lamers Bus Lines runs three daily routes between Madison and Dubuque, Green Bay, and Wisconsin Rapids. Jefferson Lines also links Madison to La Crosse on its Milwaukee to Minneapolis route. This service is partially supported by Wisconsin state intercity bus grants. In addition, seasonal limited service between Madison and Whitewater, Eau Claire, and La Crosse/Minneapolis operated by Badger Bus supports college and university student weekend travel.

Passenger Rail Service

The nearest passenger rail station with regular public service is in Columbus, Wisconsin, about 26 miles northeast of downtown Madison. This station serves Amtrak's daily Empire Builder route serving Chicago, Milwaukee, Minneapolis/St Paul, Seattle, Portland, and other cities.



Amtrak also coordinates with inter-regional bus companies to sell integrated tickets on their thruway bus service. Thruway bus service allows passengers to buy a single ticket that includes travel on Amtrak's rail service and connecting bus routes. Amtrak's national network includes a central hub in Chicago which, along

with Van Galder's Madison-to-Chicago bus service, allows convenient rail travel between Madison and many major destinations around the U.S.

Besides its long-distance service, with trains generally running daily on routes longer than 750 miles, Amtrak offers more frequent service on shorter state-supported lines. The Hiawatha Service between Chicago and Milwaukee is one of Amtrak's more successful state-supported routes with about seven daily round trips and about 800,000 passenger boardings per year. Planned improvements to the Hiawatha Service include improving frequency to ten round trips per day and increasing train speeds to 90 miles per hour. In the 2000s, the Wisconsin Department of Transportation led an effort to extend the Hiawatha Service line to Madison with improved tracks and a station near the Monona Terrace. The project was canceled in 2010.

Inter-City Bus Terminal

Inter-city buses stop in a variety of places in Madison but most serve a stop on Langdon Street on the UW campus (See Figure 3-27). Greyhound is an exception, only serving the Dutch Mill park-and-ride on Madison's southeast side. No terminal serves inter-city bus passengers – leaving them without access to bathrooms, information, or shelter. The lack of an inter-city transit terminal is inconsistent with the level of inter-city bus service in Madison. The need for a new terminal has been felt at least since Badger Bus closed their terminal on Bedford Street in 2009, and was exacerbated when inter-regional buses could no longer stop on Langdon Street due to a renovation of the Memorial Union. The stop has since moved back to Langdon Street; however, the stop is now near Lake Street, rather than in front of the UW Memorial Union.



Various sites for an inter-city terminal have been investigated, including a rail terminal near the Monona Terrace, a parcel on Bedford Street, and a terminal integrated into the Lake Street parking garage when it is reconstructed. There is general agreement on the need to provide a high quality facility that serves all the inter-city bus lines with information, ticket sales, and other amenities in a location with convenient pedestrian access to the UW, Capitol Square, and Metro Transit bus service.

Airport Access

Metro Transit provides public transit service to the Dane County airport, with Route 20 operating every 30-60 minutes between the North Transfer Point and East Towne Mall. Transfers at either location allow passengers to travel to central Madison, the UW, and other destinations in the Metro Transit service area. A trip between the Capitol Square and the airport, a five-mile trip, is scheduled to take about 31 minutes, including a five- to ten-minute wait at the North Transfer Point.

Direct limited-stop service between central Madison and the Dane County Airport has been investigated intermittently. The region's hesitancy to introduce the service is due to several factors. First, transit ridership from the airport is currently estimated at only 15 to 20 passengers per day. Although it is unclear what the demand potential would be with faster, simpler service, it is unlikely that a fixed-route service designed specifically to serve the airport could be operated with sufficient frequency to draw enough ridership and be a cost-effective use of funds. Second, the service would be duplicative of parallel service in the corridor, particularly routes 20 and 2 and/or 4.

The planned Bus Rapid Transit system includes a line along Sherman Avenue serving the North Transfer Point and Northside Town Center with some trips continuing east to the airport. This service would provide a fast trip between the airport and central Madison without a transfer.

FREIGHT

Freight Movement

The region's economic prosperity depends on the efficient movement of goods. Freight plays an important role in business efficiency, productivity, and profitability. In fact, reports show there is a strong correlation between an increase in the movement of freight and growth in gross domestic product.



In recent years, a shift towards online shopping from traditional brick-and-motor stores has had a major impact on the amount and types of freight shipments entering the community and fundamentally changed the "last mile" of freight movements. In the past, the "last mile" movement of a freight delivery was to a retail store, whereas now a number of these movements terminate at an individual address in a residential neighborhood.



Over the last few years in Dane County, freight volumes have been increasing, with trucks carrying more of these shipments. In 2007, Dane County received over 8 million tons of freight, about 1 million tons of which was carried by rail, with nearly all of the remainder carried by truck. Air and other modes (such as pipelines) carried only a very small portion of total inbound freight. At the same time over 8 million tons of freight left the region, with virtually all of it leaving via trucks. By 2014, inbound shipments had increased by over 45 percent and outbound shipments by about 9 percent. Of the nearly 12 million tons of inbound freight, nearly 11.5 million tons arrived by truck, while only 400,000 arrived by rail.

Figure 3-28

Dane County Freight Flows (2014)

	Rail Tons	Truck Tons	Air Tons	Other Tons	Total Tons	Rail Value	Truck Value	Air Value	Other Value	Total Value
Outbound	93,808	8,950,409	12,953	78	9,057,248	$57,318,279	$8,598,129,851	$844,223,852	$3,284,361	$9,502,956,343
Inbound	402,772	11,494,628	13,013	83	11,910,497	$240,770,009	$11,828,391,105	$804,907,825	$1,314,921	$12,875,383,860
Internal	3,600	2,689,808	0	0	2,693,408	$2,067,151	$1,712,152,252	$0	$0	$1,714,219,403
Totals	500,180	23,134,845	25,966	161	23,661,153	$300,155,438	$22,138,673,208	$1,649,131,677	$4,599,282	$24,092,559,606

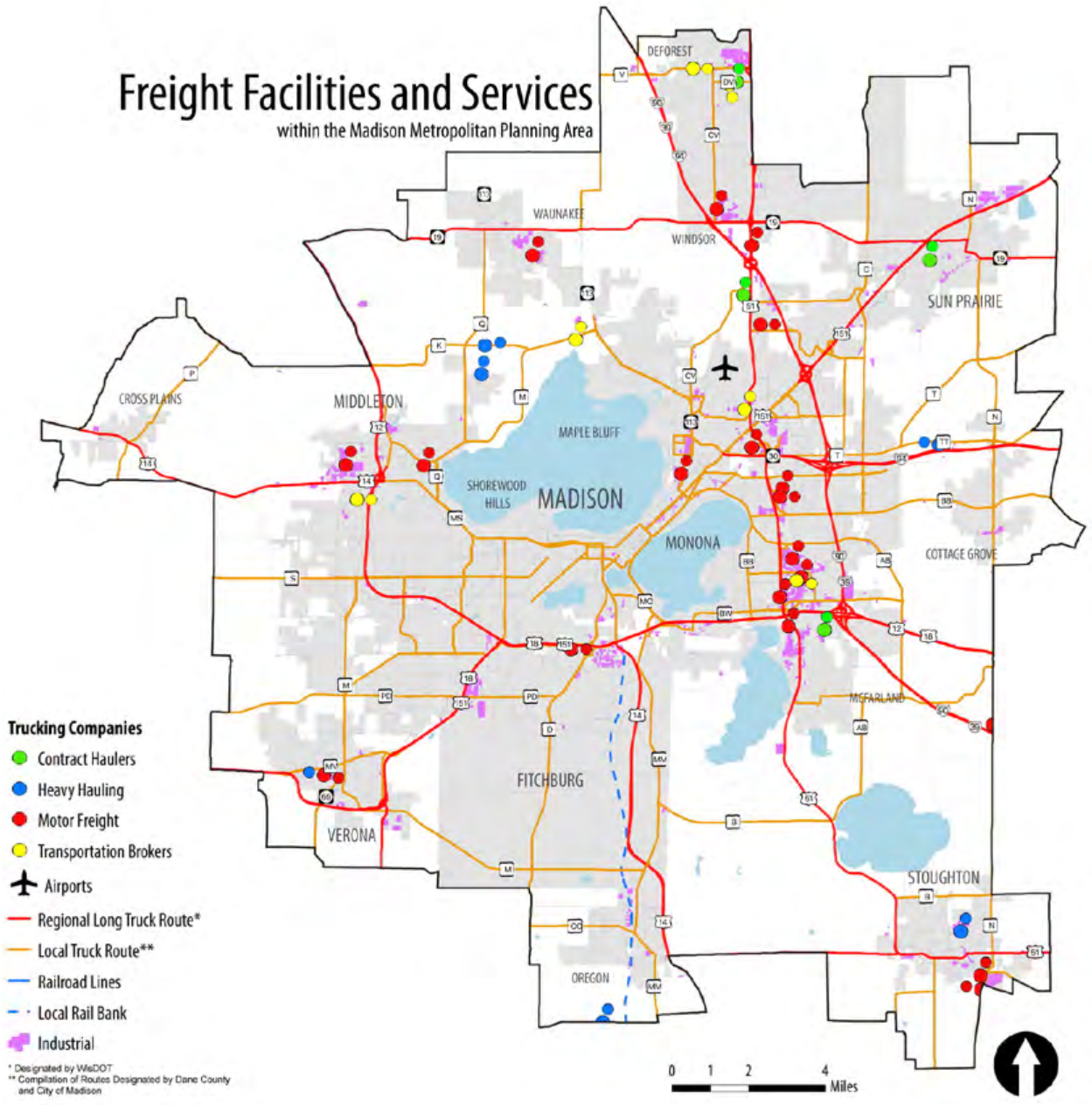


Figure 3-29: Freight Facilities and Services

Between 2007 and 2014 there was a marked increase in the amount of freight arriving by air. This is significant because air freight is dominated by high-value materials, as shown by the very high value of these shipments relative to their weight (Figure 3-28).

The total value of freight shipments, both inbound and outbound, was over $24 billion dollars in 2014. Inbound shipments had a total value of nearly $13 billion, outbound $9.5 billion, and the remainder were internal shipments. Over 90% of the total value of freight shipments was transported by truck.

Figure 3-30

Weight and Value by Mode (2014)

Mode	Tons	% of Total	Value	% of Total
Truck	23,134,845	97.8%	$22,138,673,208	91.9%
Rail	500,180	2.1%	$300,155,438	1.2%
Air	25,966	0.1%	$1,649,131,677	6.8%
Unknown	161	0.0%	$4,599,282	0.0%
Total	23,661,153	100.0%	$24,092,559,606	100.0%

Figure 3-31

Dane County Freight Tonnage by Mode (2014)

	Outbound Freight					Inbound Freight					Internal Freight	
Mode	Within WI	Outside WI	Total	% Within WI	% Outside WI	Within WI	Outside WI	Total	% Within WI	% Outside WI	Total	% of Total
Truck	5,362,444	3,542,398	8,904,841	60.2%	40%	5,888,514	5,606,114	11,494,628	51.2%	48.8%	2,689,808	99.9%
Rail	16,072	77,736	93,808	17.1%	83%	91,320	311,452	402,772	22.7%	77.3%	3,600	0.1%
Air	3,961	8,993	12,953	30.6%	69%	3,924	9,090	13,013	30.2%	69.8%	0	0.0%
Unknown	0	78	77	0.0%	100%	0	83	83	0.0%	100.0%	0	0.0%
Total	5,382,476	3,629,204	9,011,680	59.7%	40%	5,983,758	5,926,739	11,910,497	50.2%	49.8%	2,693,408	100.%

A slight majority of the freight shipped into Dane County comes from within the state of Wisconsin. Unsurprisingly, most of the rail and air freight shipped into the county comes from outside of the state, while truck freight is evenly distributed between shipments that come from Wisconsin and those coming from outside of the state. Nearly 60 percent of the outbound freight is bound for a destination within the state. Interestingly, Dane County receives four times more inbound than outbound rail tonange, while inbound and outbound air shipment tonnage is nearly identical. Intra-county freight shipments amount to 2.6 million tons, nearly all of which are carried by truck.

The county exports and receives a wide variety of commodities. The top inbound commodities by weight are broken stone or riprap (18%), gravel or sand (10%), and warehouse and distribution center goods (9%). The top outbound commodities by weight are gravel or sand (26%), grain (15%), and broken stone or riprap (10%). Internal freight largely consisted of the same commodities – broken stone or rip rap (37%), gravel or sand (19%), and petroleum refining products (18%).

Freight Facilities

Trucking

As mentioned earlier, a majority of the freight bound for and coming from Dane County is carried by trucks. The Interstate and U.S. highways that pass through the county are statutorally designated as Long Truck Routes – routes that can accommodate vehicles up to 75 feet long. These routes connect the metropolitan area to surrounding cities including La Crosse, Eau Claire, Wausau, the Twin Cities, the Fox Valley Cities, Janesville, Dubuque, Rockford, Milwaukee, and Chicago.



Local truck routes include many major local arterials and business highways within the region such as East Washington Avenue, University Avenue, McKee Road (CTH PD), Milwaukee Street, Reiner/Sprecher Roads, and Monona Drive. These routes are integral for moving freight around the region as well as to and from their local destinations. Local routes are defined by local

Figure 3-32

Dane County Inbound, Outbound, and Internal Commodities, by Tonnage (2014)

Commodity	Inbound		Outbound		Internal		Total	
	Tonnage	%	Tonnage	%	Tonnage	%	Tonnage	%
Gravel or Sand	1,232,524	10.3%	2,325,472	25.7%	521,242	19.4%	4,079,238	17.2%
Broken Stone or Riprap	2,142,057	18.0%	886,314	9.8%	1,004,541	37.3%	4,032,912	17.0%
Grain	587,880	4.9%	1,369,294	15.1%	20,704	0.8%	1,977,878	8.4%
Warehouse & Distribution Center	1,083,034	9.1%	562,369	6.2%	53,009	2.0%	1,698,411	7.2%
Petroleum Refining Products	395,170	3.3%	628,041	6.9%	490,869	18.2%	1,514,080	6.4%
Misc Waste or Scrap	527,726	4.4%	270,043	3.0%	120,199	4.5%	917,968	3.9%
Dairy Farm Products	121,181	1.0%	571,323	6.3%	10,753	0.4%	703,258	3.0%
Ready-mix Concrete, Wet	429,090	3.6%	91,843	1.0%	123,094	4.6%	644,027	2.7%
Misc. Field Crops	346,597	2.9%	120,828	1.3%	9,836	0.4%	477,260	2.0%
Asphalt Paving Blocks or Mix	379,740	3.2%	-	0.0%		0.0%	379,740	1.6%
Concrete Products	269,007	2.3%	33,091	0.4%	16,046	0.6%	318,145	1.3%
Prepared or Canned Feed	86,514	0.7%	204,642	2.3%	8,654	0.3%	299,811	1.3%
Liquefied Gases, Coal or Petroleum	139,806	1.2%	81,558	0.9%	19,362	0.7%	240,725	1.0%
Cut Stone or Stone Products	80,625	0.7%	106,459	1.2%	37,650	1.4%	224,734	0.9%
Bread or Other Bakery Prod	54,128	0.5%	119,521	1.3%	25,459	0.9%	199,108	0.8%
Livestock	147,116	1.2%	28,788	0.3%	1,212	0.0%	177,116	0.7%
Misc Plastic Products	64,879	0.5%	100,122	1.1%	5,192	0.2%	170,193	0.7%
Oil Kernels, Nuts or Seeds	42,059	0.4%	116,061	1.3%	2,057	0.1%	160,177	0.7%
Soft Drinks or Mineral Water	155,238	1.3%	-	0.0%	-	0.0%	155,238	0.7%
Misc Food Preparations, Nec	65,356	0.5%	63,593	0.7%	13,861	0.5%	142,810	0.6%
Primary Iron or Steel Products	139,034	1.2%	-	0.0%	-	0.0%	139,034	0.6%
Truck Trailers	18,855	0.2%	85,278	0.9%	21,978	0.8%	126,111	0.5%
Misc Industrial Organic Chemicals	120,172	1.0%	-	0.0%	-	0.0%	120,172	0.5%
Fertilizers	37,042	0.3%	62,630	0.7%	14,040	0.5%	113,711	0.5%
Misc Metal Work	44,187	0.4%	60,685	0.7%	7,434	0.3%	112,306	0.5%
Lumber or Dimension Stock	111,693	0.9%	-	0.0%	-	0.0%	111,693	0.5%
Portland Cement	86,772	0.7%	8,694	0.1%	15,850	0.6%	111,315	0.5%
Meat Products	17,408	0.1%	77,680	0.9%	8,586	0.3%	103,674	0.4%
Metal Scrap or Tailings	-	0.0%	102,528	1.1%	-	0.0%	102,528	0.4%
Paper Waste or Scrap	978	0.0%	97,512	1.1%	1,022	0.0%	99,512	0.4%
Flour or Other Grain Mill Products	98,680	0.8%	-	0.0%	-	0.0%	98,680	0.4%
OTHER	2,885,948	24.2%	882,881	9.7%	140,759	5.2%	3,909,588	16.5%
Total	11,910,497	100%	9,057,248	100%	2,693,408	100.0%	23,661,153	100%

municipalities and Dane County and are shown in orange on the map to the right.

The metropolitan area is home to numerous trucking companies including contract haulers, heavy hauling companies, motor freight companies, and transportation brokers. Most of these companies cluster in industrial areas and near long truck routes. Many truck companies are located along the US Highway 51 corridor due to the corridor's relatively easy access to the Interstate System.

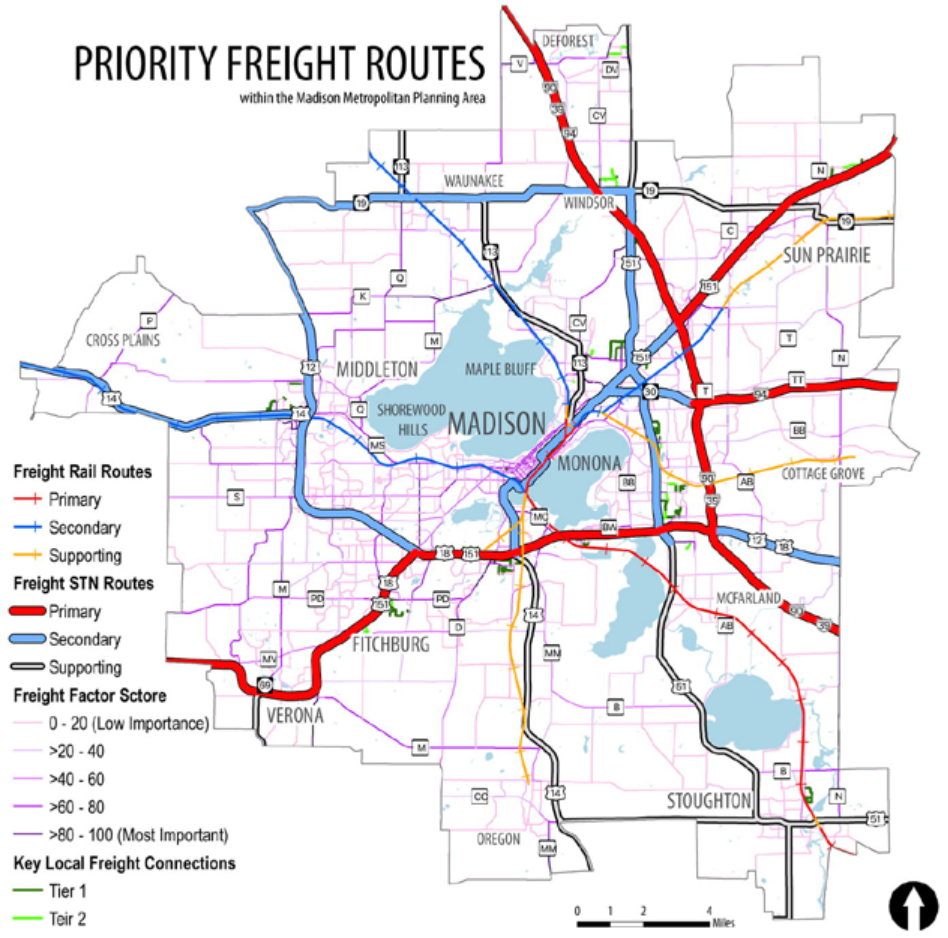


Figure 3-33: Priority Freight Routes

Rail

The Wisconsin and Southern Railroad Company (WSOR) is the principal or sole operator on all of the rail lines in the area except for a segment that runs between Madison and DeForest that is owned by Canadian Pacific. WSOR connects the region with over 21 counties in southern Wisconsin and northern Illinois on its more than 700 miles of track.

Air

The Dane County Regional Airport (MSN) on the north side of Madison provides air cargo service to the region. The most recent major change in cargo operations at the airport occurred in 2010, when FedEx increased service to meet the demands





of the recovering economy, following the departure of a competing air cargo operator. Goods shipped by air tend to be high value, low weight, and perishable or otherwise time sensitive. Examples include medical equipment, farm and food products, and medical samples.

Intermodal

Intermodal facilities provide access and service to multiple modes of transportation without any handling of the freight itself while changing modes. There are no intermodal facilities in Dane County.

Priority Freight Routes

WisDOT is finishing up work on the first State Freight Plan. As part of the planning effort, WisDOT examined all freight routes within the state and identified of the most important regional routes, rail lines, and local routes. For local routes, state highways, railroads, ports, and airports WisDOT developed a "freight factor" based on the freight tonnage, value, and connection between modes that a particular route provides. The freight factor of a roadway signifies the importance of a route to the freight network.

The map on the previous page identifies primary, secondary, and supporting rail and state highway network routes. Additionally, it highlights the freight factor of local routes, and key local freight connections.

National Highway Freight Program

Section 1116 of the FAST Act established a new National Highway Freight Program (NHFP) to increase the efficiency of freight movement on the National Highway Freight Network (NHFN), replacing the National Freight Network and Primary Freight Network created under MAP-21. The NHFN is composed of the following road systems:

- Primary Highway Freight System (PHFS)- The most critical highway portions of the US freight transportation system.
- Interstate routes not on the PHFS.
- Critical Urban Freight Corridors (CUFC)- Roads in urbanized areas which provide access and connect the PHFS and interstates with ports, public transportation facilities, or other intermodal transportation facilities. Each state, in consultation with MPOs, may designate up to 75 miles of highway as CUFCs.
- Critical Rural Freight Corridors (CRFC)- Roads not in an urbanized area which provide access and connect the PHFS and interstates with ports, public transportation facilities, or intermodal transportation facilities. Each state may designate up to 150 miles of highway as CRFCs.

The FAST Act requires FHWA to re-designate the PHFS every 5 years to reflect changes in freight flows; states can designate CUFCs and CRFCs on a rolling basis. National Highway Freight Program funds may only be used for projects on the NHFN.

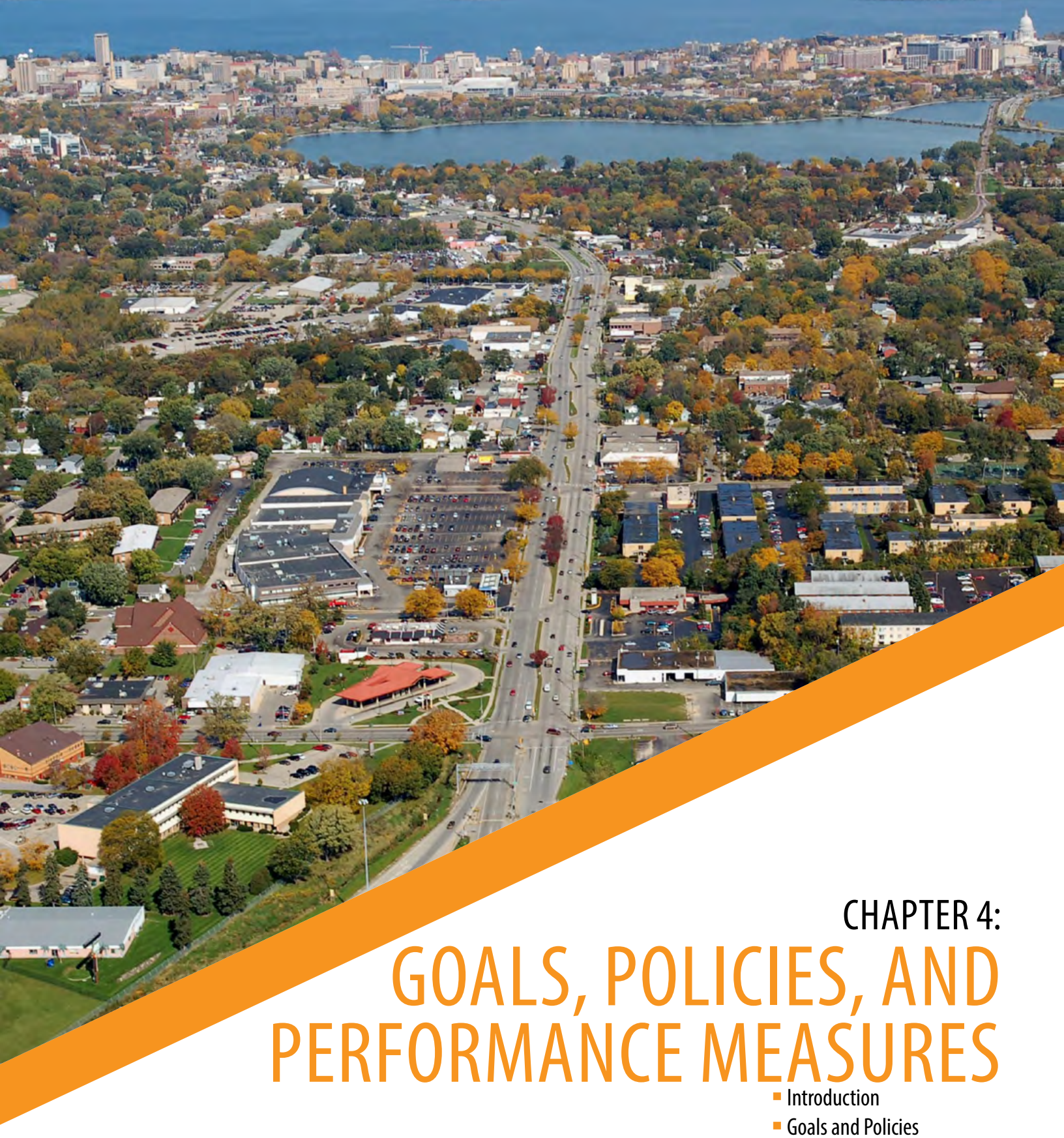
As shown in Figure 3-34, in Dane County Interstates 39, 90, and 94 are included in the PHFS of the NHFN, in addition to approximately 12 miles of the Beltline from Gammon Road to I-39/90.

As part of the draft National Freight Strategic Plan, the U.S. DOT has proposed a draft National Multimodal Freight Network (NMFN) that includes railways, waterways, ports and harbors, pipelines, airports, and intermodal facilities, in addition to highway facilities, that is a more comprehensive collection of the facilities that are critical to the safe and efficient movement of freight throughout the country.





Figure 3-34: National Highway Freight Network in Wisconsin



CHAPTER 4:
GOALS, POLICIES, AND PERFORMANCE MEASURES

- Introduction
- Goals and Policies
- Performance Measures

INTRODUCTION

The Regional Transportation Plan (RTP) goals and policies are based upon the principles of sustainability. Sustainability is defined generally as meeting our current economic, community, and environmental needs without sacrificing the ability of future generations to do the same. Social equity, a healthy environment, and a prosperous economy are described as the "three Es" of sustainability.

Social Equity: The transportation system should be designed to provide an equitable level of services to all segments of the population across all modes.

Environment: The transportation system should be designed and operated within the context of its environment, minimizing negative impacts and fostering efficient development patterns that optimize travel, housing, and employment choices. The system should support existing and planned development and discourage growth in rural areas.

Economy: The transportation system should ensure that businesses have maximum opportunities to serve customers, reach clients, export goods, and obtain workers. The system should play a significant role in raising the region's standard of living and quality of life.



These principles of sustainability are prominently featured and interwoven into a number of the RTP goals and the policies that support those goals.

The RTP goals and policies also build upon the vision and goals developed and approved by the Capital Region Sustainable Communities (CRSC) Consortium, of which MATPB is a member. The CRSC consortium was formed in 2011 to carry out the work of a federal Sustainable Communities Regional Planning Grant. The grant funded a number of projects, including a Bus Rapid Transit feasibility study. In addition to these projects, the Consortium forged agreement on a vision for the region of a "healthy and flourishing place for all" and a related series of broad goals:

- Healthy Ecosystems
- Economic Competitiveness
- Housing Choice
- Efficient, Effective Transportation
- Healthy Food and Farms
- Efficient Utilities and Service
- Vibrant Culture
- Regional Collaboration

Livability

There is no singular definition of the term "livability," as everyone values different aspects of urban living differently. We are using the term to refer to neighborhoods and communities that are walkable and provide transportation choices, good access to jobs and services, affordable housing, quality schools, parks and other public spaces, and safe streets. By design, they are more compact and pedestrian-oriented with a mix of uses in close proximity. They support people of all ages and invest in existing neighborhoods and amenities such as art, cultural heritage, and street and development designs that create a sense of place.



Downtown Waunakee.

Complete Streets

Complete streets are streets that are designed, built, and operated to accommodate safe access for all users including pedestrians, bicyclists, transit riders, and motorists. Complete streets vary between communities because their design is based on their unique context and needs. A complete street in a highly urban environment may include bus lanes, wide sidewalks, bike lanes, median islands, and curb extensions whereas a complete street in a rural environment may have a separated path parallel to a roadway or a wide shoulder.



Downtown Madison.

GOALS AND POLICIES

The development of the Regional Transportation Plan (RTP) 2050 began by developing a set of goals that represent overarching aspirational statements about desired outcomes that the region will work towards achieving. A set of policies was then developed that support each goal. The goals and policies serve as the foundation for the plan. They will guide the selection of the projects included in the plan and the identification of the strategies and recommendations. The goals and policies will also be used by MATPB as the basis for criteria used to select projects identified in the plan for funding with federal transportation funds MATPB receives.

As part of continuing efforts to ensure coordination of regional land use and transportation planning, MATPB has made certain that the policies developed for the RTP, particularly those related to land use development and environmental protection, are consistent with the amended goals and objectives adopted by the Capital Area Regional Planning Commission (CARPC) in 2008 for the regional land use plan.

Goal 1: Create Connected Livable Neighborhoods and Communities

Create interconnected livable places linked to jobs, services, schools, shops, and parks through a multi-modal transportation system that is integrated with the built environment and supports compact development patterns that increase the viability of walking, bicycling, and public transit.

<u>Policies supporting this goal:</u>

1. Coordinate land use, housing, and transportation planning and decision making to foster compact development patterns that provide transportation and affordable, accessible location-efficient housing choices.
2. Promote walkable, mixed-use neighborhoods.
3. Encourage growth in areas of existing development that place jobs, housing, and services closer together.
4. Encourage the concentration of higher density and mixed-use development in activity centers and along major transit corridors.
5. Enhance existing retail and employment centers in transit corridors by adding residential and other complementary land uses and making them more pedestrian friendly.
6. Encourage street oriented, human-scaled development designs that create accessible, vibrant neighborhoods.
7. Build Complete Streets that are safe, convenient, and attractive for everyone, regardless of age, ability, or mode of transportation.
8. Provide a well-connected street network and facilities for walking and bicycling that provide transportation choices and convenient

access to daily activities.

9. Encourage transit-supportive land uses along existing and planned transit routes and use of transit-compatible site and street designs, where appropriate.
10. Utilize context sensitive transportation facility design that is a product of integrated land use and transportation planning and supports community character.

Goal 2: Improve Public Health, Safety, and Security

Design, build, operate, and maintain a transportation system that enables people to get where they need to go safely and that, combined with supportive land use patterns and site design, facilitates and encourages active lifestyles while improving air quality.

Policies supporting this goal:

1. Address the safety and security of all users in planning, designing, building, operating, and maintaining the transportation system.
2. Retrofit existing transportation facilities that pose safety risks with safer, modern designs.
3. Seek to minimize conflicts between motorized and non-motorized traffic through lower roadway speeds where appropriate, provision of safe and convenient street crossings, and other means.
4. Support education and research programs and law enforcement efforts to improve safety for all transportation users, focusing on behaviors resulting in the greatest risk of serious crashes, including driving while impaired, distracted driving (in particular texting), and aggressive driving.
5. Encourage mixed-use development and street designs with vibrant public spaces that support a culture of walking, bicycling, use of transit, and social interaction.
6. Prioritize active transportation facility improvements that will improve access to jobs, schools, healthy food, and other destinations that meet daily needs and those located in areas with health disparities and under-served populations.
7. Promote and facilitate active transportation for short trips, including maintenance of active transportation facilities to ensure year-round availability.
8. Manage access to the regional roadway system to preserve and improve safety as well as operational efficiency.
9. Employ intelligent transportation technologies to improve safety as well as system efficiency and reliability.
10. Design, build, and operate the regional transportation system to support timely and safe response to emergencies.
11. Reduce vulnerability of the public and the region's transportation infrastructure to crime and natural hazards.

Transit Compatible Site and Street Designs

Transit compatible site designs are development configurations that enable convenient access to and from bus routes by minimizing walking distances, providing appropriate densities to support transit ridership, and providing a safe and comfortable boarding and alighting experience. Walkability is key because most transit trips begin and end with walking.

Transit compatible street designs use urban design coupled with street features that encourage safe traffic speeds and prioritize space for pedestrians, bicyclists, and transit. This could include adding bus-only lanes or installing bus bulbs for boarding and alighting as well as providing facilities that make walking or biking to or from stops easier, safer, and more enjoyable. This includes provision of frequent crossing opportunities.



Transit compatible streets and features.

Intelligent Transportation Systems (ITS)

There is no single commonly accepted definition of ITS because the discipline is still in its infancy. ITS encompasses a broad range of technologies that make transportation safer, more efficient, and more convenient by integrating communications technology into infrastructure, vehicles, and other devices. A few examples of ITS include:

- Intelligent traffic control systems that improve traffic flow by changing timing in response to traffic flows
- Traveler information systems that provide current travel time and incident information
- Advanced transit systems that provide real-time vehicle information
- Vehicle-to-vehicle communications that can prevent crashes by alerting drivers or slowing vehicles before crashes occur
- Automated at-grade railroad crossing safety gates



Vehicular travel information on the Beltline. (Channel 3000)

Context Sensitive Solutions (CSS)

Context sensitive solutions take into consideration the built and natural environment ("the context") through which transportation facilities pass, attempting to fit the facility to the physical setting and preserve or complement scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility for users. The application of CSS principles recognizes that transportation is about more than just getting from Point A to Point B. Transportation facilities help shape the character of places and how we experience our daily lives.



Bridge with Madison branding within an urban context.

Goal 3: Support Personal Prosperity and Enhance the Regional Economy

Build, operate, and maintain a transportation system that provides people with affordable access to jobs and enables the exchange of goods and services within the region and to/from other regions.

Policies supporting this goal:

1. Provide for efficient, reliable travel on regional roadways serving major employment centers and those critical to freight movement, reducing excessive delays where possible.
2. Support downtown Madison as the region's largest, most important activity center through improvements to its accessibility by transit as well as other transportation modes.
3. Invest in transportation improvements that foster a quality of life that retains and attracts businesses and employees.
4. Invest in transportation improvements that support the region's role as a major tourist destination.
5. Provide convenient, inexpensive transportation options that allow households to go car-light or car-free, allowing more money to be spent on housing or in the local economy.
6. Encourage redevelopment of established employment/activity centers and major transit corridors to make efficient use of existing transportation infrastructure.
7. Support agricultural activities in rural areas by designing roadways that safely accommodate implements of husbandry.
8. Provide efficient freight access to regional roadways, railroads, and the airport.
9. Promote investments that enhance inter-regional transportation options.
10. Integrate local public transit with intercity service and facilities such as the airport.

Goal 4: Improve Equity for Users of the Transportation System

Provide an equitable level of transportation facilities and services for all regardless of age, ability, race, ethnicity, or income.

Policies supporting this goal:

1. Provide convenient, affordable transportation options that enable people of all ages and abilities to access jobs, services, and other destinations to meet their daily needs. Also support private sector efforts to provide complementary transportation options.
2. Improve transit accessibility to jobs in areas with concentrations of transit-dependent populations and support provision of affordable housing in areas with high transit accessibility to jobs.

3. Ensure that the interests of underrepresented groups (low-income, minority, seniors, disabled, etc.) are considered in the transportation planning process.
4. Ensure that the benefits of regional transportation system investments, in terms of improved accessibility, mobility, and quality of life, are fairly distributed and that adverse public health and environmental impacts from transportation facilities do not disproportionately impact minority and low-income populations.
5. Retrofit existing transportation facilities to make them ADA compliant.

Goal 5: Reduce the Environmental Impact of the Transportation System

Ensure that the transportation system is designed, built, operated, and maintained in a way that protects and preserves the natural environment and historic and cultural resources, and is supportive of energy conservation.

Policies supporting this goal:

1. Design and build sustainable transportation infrastructure and implement operations programs that avoid or mitigate negative environmental impacts and augment positive changes.
2. Incorporate Green Streets elements into street construction and reconstruction, where feasible. Projects should, at a minimum, meet Dane County stormwater standards, but strive to maintain pre-development hydrology.
3. Pursue intelligent transportation technologies that improve traffic flow, encourage eco-driving, make transit and bicycling easier and more convenient, create new mobility services, provide traveler information, and better integrate the different modes. Projects implementing these technologies should encourage and facilitate private sector transportation innovation and integration of public and private transportation options.
4. Incentivize alternatives to single-occupant vehicle driving through strategic investments in alternative transportation, public and employer-based commute options programs, TDM/vehicle trip reduction ordinances, and parking policies.
5. Develop a transportation system that is resilient in the face of climate change and rising fuel prices in the future.
6. Promote the transition to low and no emission fuels for vehicles.
7. Consider land use impacts of transportation investments, ensuring they meet regional goals.
8. Promote the movement of long-distance freight by railroads, which use less fuel per ton-mile than trucks.

Green Streets

Green Streets refers to best management practices that minimize the environmental impact of the transportation system. The streets are designed in a way in which they mimic local hydrology prior to development. A number of treatments can be considered including:

- Narrower street pavements to minimize impervious surfaces
- Swales or vegetated open channels for stormwater storage and runoff
- Bioretention curb extensions, planters, and tree boxes to incorporate stormwater management within the right of way
- Permeable pavement, asphalt, and pavers that can reduce pollutant runoff through built-in filtering to decrease the volume of water diversion into neighboring streams, rivers, and lakes
- Street trees to reduce heat island effects, increase the aesthetic quality of streets, improve air quality, and provide shade for cooling on warm days



Permeable pavement (top), prairie swale (middle), street trees (bottom).

Activity Centers

Activity centers are areas in which there is a concentrated mix of land uses (residential, retail, office, institutional). They are generally bicycle and pedestrian friendly and transit supportive. They serve as a hub of daily activity, allowing those who live there and in surrounding neighborhoods to accomplish multiple activities in a single trip. Activity centers come in different types and sizes from a regional center serving as a center of commerce, to suburban downtown districts, to small neighborhood centers with shopping and restaurants. Activity centers can serve new peripheral development or be created through infill or redevelopment of existing areas. A unique sense of place should be created by attention to the scale, placement, and design of buildings and ensuring adequate public spaces.



Mixed-use activity center concepts in Madison, Waunkee, and Sun Prairie.

Goal 6: Advance System-wide Efficiency, Reliability, and Integration Across Modes

Design, build, operate, and maintain an efficient transportation system with supportive land use patterns that maximize mobility, minimizes unexpected delays, and provides seamless transfers between all modes.

Policies supporting this goal:

1. Encourage compact, mixed-use development patterns, which reduce reliance on the automobile, improving the efficiency and safety of the transportation system.
2. Encourage development in identified transportation and transit corridors and activity centers where adequate transportation facilities and efficient transit service can be provided.
3. Utilize transportation systems management and operations strategies, such as incident, special event, and work zone management, traffic signal coordination, and transit priority treatments, to maximize efficiency and reliability for all transportation modes.
4. Manage access to the regional roadway system to preserve and improve operational efficiency.
5. Provide for a well-connected roadway system with proper roadway spacing that efficiently distributes traffic.
6. Implement policies and programs to manage travel demand on congested corridors in order to maximize system capacity and multi-modal system performance.
7. Promote parking management strategies that make efficient use of facilities and encourage alternative transportation modes while meeting user needs and supporting retail/service businesses.
8. Seek to provide and maintain an acceptable level of service for all travel modes, considering the land use context of the facility and environmental impacts of potential improvements.
9. Utilize intelligent transportation technologies to make travel by all modes more reliable and convenient.
10. Prioritize capacity investments on critical bottlenecks and corridors that serve regional employment centers, particularly those where alternative modes cannot effectively and cost-efficiently serve travel needs.

Goal 7: Establish Financial Viability of the Transportation System

Achieve and maintain a state of good repair for the existing transportation system, invest in cost-effective projects, and ensure adequate, reliable funding to meet current and future needs.

Policies supporting this goal:

1. Make the most efficient use of limited public resources through cost-benefit analyses and consideration of the life cycle costs of projects, including operations and maintenance.
2. Utilize designs, construction techniques, and materials that minimize maintenance costs over time.
3. Promote asset management practices that minimize maintenance costs over time.
4. Prioritize maintenance of existing transportation facilities, strategies to manage travel demand, and improvements to transportation operations over new facilities and capacity expansion projects.
5. Support compact, transportation-efficient development that makes use of existing transportation system capacity.
6. Preserve transportation corridors and other needed land for future travel uses.
7. Support inter-jurisdictional coordination in planning and project delivery.
8. Leverage federal and state funding for large-scale projects that will provide significant benefits to the regional transportation system.
9. Support sustainable funding options beyond the state gas tax and local property tax, and a regional transit governance structure such as a regional transit authority.
10. Foster innovative financing and public-private partnerships for projects.

PERFORMANCE MEASURES

The *Moving Ahead for Progress in the 21st Century Act* (MAP-21) transformed the way that MPOs develop transportation policies and plans and changed the way that they make funding decisions and program new projects. MAP-21 required that a performance-based approach be taken to transportation planning and programming to achieve local, state, and national performance goals. The current transportation bill, the Fixing America's Surface Transportation (FAST) Act, continues this approach. MPOs are now required to:

- incorporate performance management systematically into regular ongoing processes;
- provide key information to help decision makers understand the consequences of investment decisions across multiple markets;
- improve communications between decision makers, stakeholders, and the traveling public; and
- ensure that targets and measures are developed in cooperative partnerships based on data and objective information.

The national performance goals included in FAST Act did not change:

- Safety - To achieve a significant reduction in traffic fatalities and serious injuries on all public roads
- Infrastructure Condition - To maintain the highway infrastructure asset system in a state of good repair
- Congestion Reduction - To achieve a significant reduction in congestion on the National Highway System, which includes all major or principal arterial roadways
- System Reliability - To improve the efficiency of the surface transportation system
- Freight Movement and Economic Vitality - To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development
- Environmental Sustainability - To enhance the performance of the transportation system while protecting and enhancing the natural environment
- Reduced Project Delivery Delays - To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices





National Performance Goals are set in a variety of transportation topic areas.

MATPB has demonstrated its commitment to performance-based planning by releasing its first annual Performance Management Report in 2016. Based upon the goals of RTP 2050, the Performance Measures Report links measures to goals in an effort to quantify outcomes. For the first year of the report the following measures, organized around the goals, were selected:



Create Connected Livable Neighborhoods and Communities

- Miles of Pedestrian Facilities
- Miles of Bicycle Facilities
- B-Cycle Utilization
- Active Living Index Scores

Improve Public Health, Safety, and Security

- Number and Rate of Motor Vehicle Crash Fatalities and Serious Injuries
- Number and Rate of Non-Motorized Fatalities and Serious Injuries
- County-wide Five-year Rolling Average Rates of Crashes, Injuries, and Fatalities

Support Personal Prosperity and Enhance the Regional Economy

- Airline Passenger Traffic
- Freight Exports and Imports
- Housing + Transportation Costs
- Transit Access to Jobs

Improve Equity for Users of the Transportation System Transit Ridership

- Fixed-Route Transit Service Area
- Transit Access to Employment
- Transit Coverage for Underrepresented Groups

Reduce the Environmental Impact of the Transportation System

- Vehicle-Miles Traveled
- Mode of Transportation to Work
- Air Quality

Ensure System-Wide Efficiency, Reliability, and Integration Across Modes

- Transit On-time Performance
- Percent of Key Destinations Served by Transit
- Roadway Congestion and Reliability

Ensure Financial Viability of the Transportation System

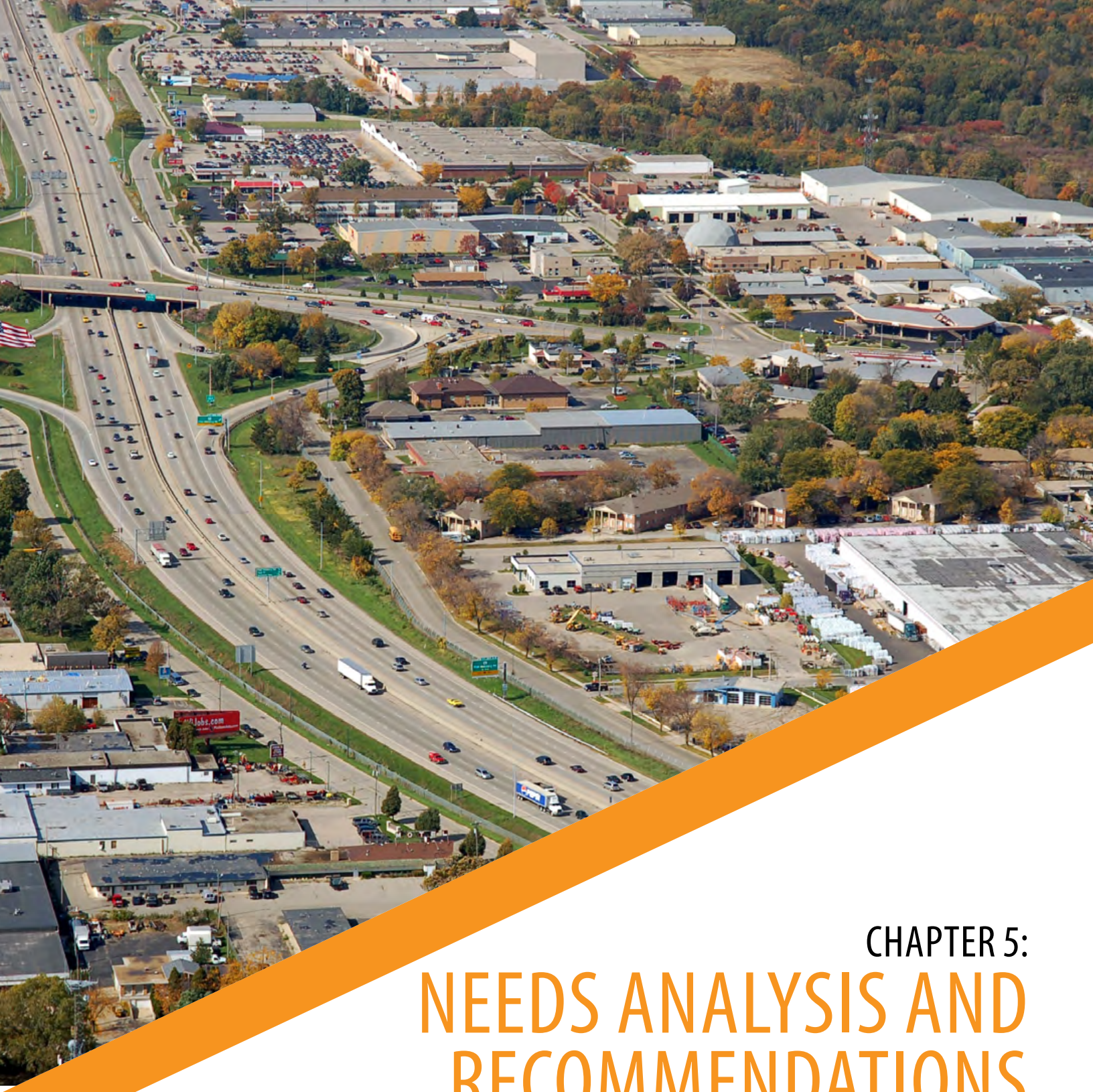
- Bridge Condition
- Roadway Pavement Condition
- Metro Vehicle On-Road Service Calls
- Buses At or Past Replacement Age

The performance measures selected were not intended to be exhaustive. Rather, the list includes key measures that allow annual tracking of meaningful progress towards achieving plan goals and for which accurate, easily obtainable data is available. Some measures are applicable to more than one goal but have been organized under the goal that fits best. Some aspects of the plan goals are not addressed by the measures due to unavailable, incomplete, or inaccurate data. It is anticipated that the list of performance measures will evolve over time as new data and measurement techniques become available. Targets for the measures will be set in concert with WisDOT, following the release of final federal rules for some of these measures.

To learn more about performance management requirements and how they fit into the overall planning process, refer to Chapter 1.







CHAPTER 5:
NEEDS ANALYSIS AND RECOMMENDATIONS

- Introduction
- Land Use and Transportation Integration
- Streets and Roadways
- Public Transit
- Bicycles
- Pedestrians
- Specialized Transit
- Transportation Demand Management
- TSM, Operations, and ITS
- Freight, Air, and Rail
- Parking

INTRODUCTION

MATPB undertook an exhaustive analysis of the existing transportation network, prior and ongoing planning efforts, and input received from stakeholders and the public. MPO staff then synthesized the transportation system needs and developed a series of recommendations with supporting actions for each mode of transportation, TDM and TSM strategies to optimize use and capacity of existing facilities, and general recommendations for land use and transportation integration.



Implementing agencies, including WisDOT and local governments, are encouraged to use the following recommendations when undertaking planning efforts and implementing transportation projects to ensure regional continuity and consistency of the transportation system and support regional transportation goals and policies. The discussion of needs and the recommendations is organized by topic area and mode with the recommendations and supporting actions/strategies or implementation steps highlighted in the tables.

Needs and Recommendations are organized as follows:

- Land Use and Transportation Integration
- Streets and Roadways
- Public Transit
- Bicycles
- Pedestrians
- Inter-Regional Travel
- Specialized Transit
- Travel Demand Management (TDM)
- Transportation System Management (TSM), Operations and Intelligent Transportation Systems (ITS)
- Freight, Air, and Rail
- Parking

Appendix A contains a complete table of the recommendations and supporting actions.

LAND USE AND TRANSPORTATION INTEGRATION



Land use and transportation are inextricably related. The ultimate role of transportation is to connect people with opportunities, services, goods, and other resources. In order for transportation policies and investments to be successful in achieving this, they must be coupled with supportive land use policies. Spread out land use patterns and single use developments increase automobile dependency for accessing economic opportunities and needs, thereby placing other travel modes at a disadvantage. Pedestrian-friendly neighborhoods, with a variety of land uses in close proximity, improve access to destinations and promote affordability by making alternative travel modes more convenient.

Coordinate land use and transportation. Coordinating land use and transportation requires that local communities evaluate how land use decisions affect the transportation system and travel options for people to access jobs, services, and other destinations. It requires that transportation agencies and providers consider the effects of transportation investments on land use development demand, travel choices, and regional land use patterns. This also means that transportation agencies and local communities must communicate to craft coordinated strategies, plans, and programs.

The following recommendations can help ensure the compatibility and integration of local land use plans with the regional transportation plan.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Adopt local land use plans and policies that support RTP goals and policies.		
A	Update land use ordinances, street design, and parking standards to remove barriers to mixed-use, pedestrian-friendly development, where appropriate.	Ongoing	Local governments
B	Prepare detailed neighborhood development plans in areas slated for growth prior to development in order to ensure good street connectivity, adequate bicycle accommodations, and efficient transit routes (where appropriate).	Ongoing	Local governments
C	Require or provide incentives for including pedestrian, bicycle, and transit facilities (where appropriate) in (re)developments.	Ongoing	Local governments
D	Plan, zone for, and encourage transit-supportive development in planned transit corridors.	Ongoing	Local governments
2	Develop urban areas with a mix of housing types and land uses to provide walkable, affordable neighborhoods.		
A	Plan for mixed-use centers of varying scales and types to provide housing in proximity to a mix of uses.	Ongoing	Local governments
B	Develop new employment centers and government/institutional developments in mixed-use settings, where compatible, to provide for housing near jobs and schools.	Ongoing	Local governments
C	Support the revitalization of downtown areas and walkable neighborhoods with infrastructure investments and incentives.	Ongoing	Local governments
D	Promote new development in multi-modal mobility corridors to maximize the efficiency of transportation system and the accessibility of jobs and services.	Ongoing	Local governments

STREETS AND ROADWAYS

Streets and roadways provide mobility for the vast majority of the residents in the region, regardless of whether they drive, take transit, or ride a bicycle. Streets can also be considered the "living rooms" of neighborhoods throughout the community, providing an outdoor space to congregate, recreate, and socialize. It is important to preserve this infrastructure and make targeted enhancements, when appropriate. The following highlights the major needs and recommendations to ensure the efficiency, safety, and cost effectiveness of the roadway network.



Preserve existing regional roadway infrastructure. Preserving the regional roadway system—including pavement, bridges, and associated infrastructure such as signals, lighting, and storm water facilities—is critical for safe and efficient travel. Well-maintained roads also help to reduce vehicle operating costs, retain and attract businesses, and improve quality of life for the region's residents.

Roadways and bridges can last a long time before they need to be reconstructed or replaced (typically 50+ years for roads and 50-75 years for bridges). However, routine small-scale maintenance and periodic rehabilitation are necessary to combat the steady deterioration that results from roadway use and weathering, and avoid the need for premature pavement reconstruction.

Figure A-1 in Appendix A lists programmed, planned, and other potential cost-high preservation projects that may be needed during the planning period. This includes both peripheral area arterial roadways that will need to be reconstructed to urban standards to accommodate planned development and arterial streets within developed areas that will require reconstruction due to their age and condition.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Preserve and maintain the region's street and highway system in a manner that minimizes life cycle cost, maintains safety, and minimizes driver costs while reducing their impact on the environment.		
A	Monitor regional roadway system pavement and bridge condition and coordinate with WisDOT to establish performance targets.	1-5 years	MPO, WisDOT
B	Develop and implement asset management plans to facilitate cost-effective decision-making concerning the maintenance and rehabilitation of roadways, bridges, and associated infrastructure.	Ongoing	WisDOT, Dane County, local governments
C	Provide for ongoing maintenance activities in major state and local arterial corridors planned for future potential expansion until capacity is needed and major project funding can be secured.	Ongoing	WisDOT, Dane County, local governments
D	Continue enforcement of truck weight regulations to reduce premature deterioration of roadways and bridges.	Ongoing	WisDOT
E	Support additional research and demonstration projects, including use of emerging technologies, to provide safe roadways in the winter while minimizing the use of road salt.	1-5 years	WisDOT, Dane County, local governments

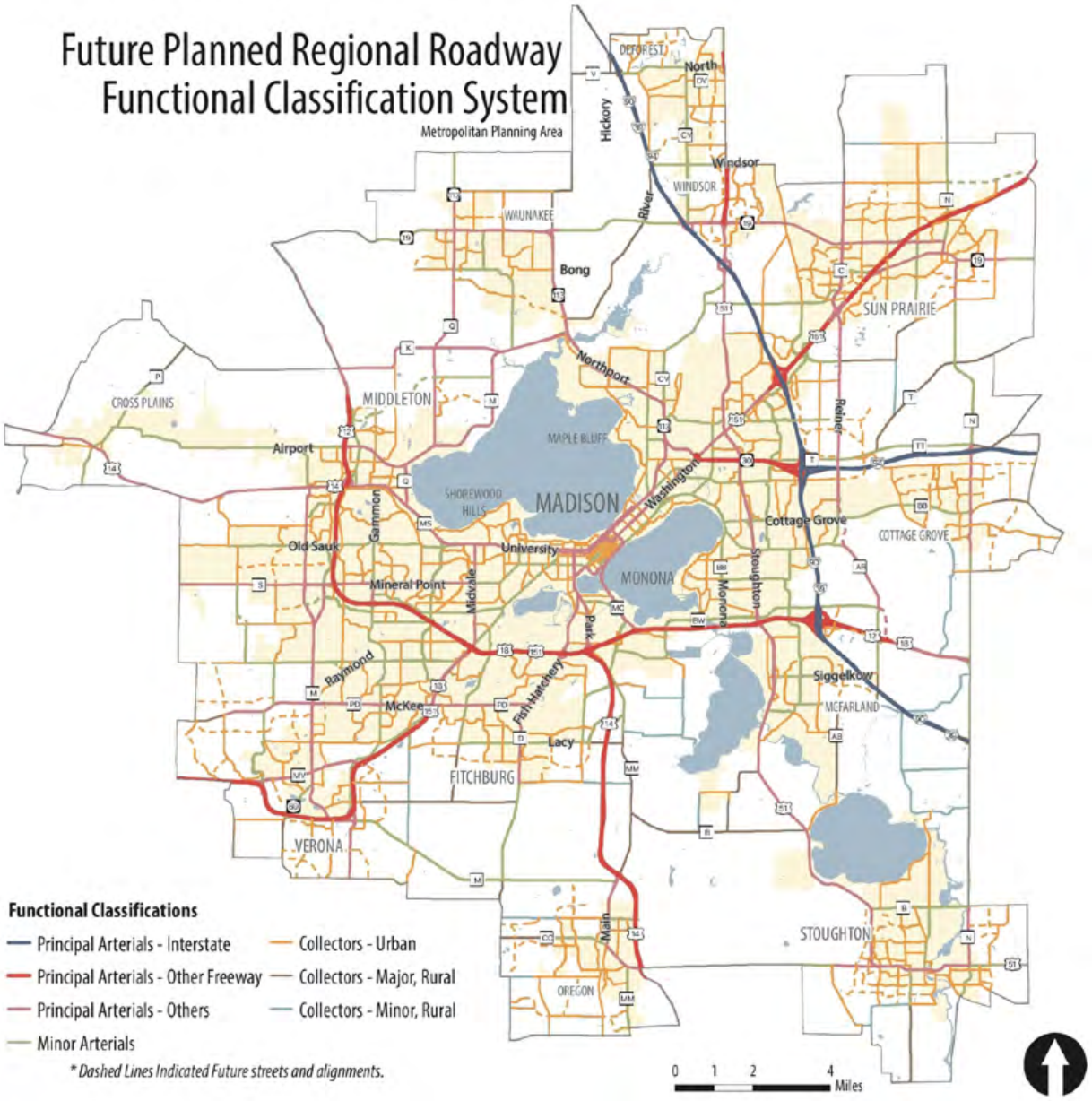


Figure 5-1: Future Planned Roadway Functional Classification System.

Construct new roadways to efficiently accommodate future growth. Planning for and building a well-connected roadway network to serve developing areas is crucial for efficiently distributing traffic on the regional system. As connectivity of the system increases, travel distances decrease and route options increase, creating a more efficient and resilient system. Dispersing traffic over a larger number of routes benefits traffic circulation and better supports alternative travel modes by providing more route options and limiting the need for overly wide arterials and intersections that serve as barriers to pedestrians. Other benefits of a well-connected network include improved emergency response and increased efficiency and safety of services such as garbage collection and street sweeping.

The traditional roadway functional classification system described on pages 3-3 to 3-5 provides a good starting point for planning and managing our roadway system to provide mobility for moving passenger and freight traffic while also providing property access, parking, and safe, convenient, and comfortable travel for non-motorists. Traffic speeds, access, and level of street connectivity should vary depending on the function of the street. The design of streets and the level of traffic congestion

tolerated must also consider the land use context, community development goals, and all modes of travel.

Figure 5-1 illustrates the planned future roadway functional classification system, including important planned collector streets and existing collectors that are likely to transition into minor arterials in the future to serve new development. Examples include the Pioneer/Meadow/Woods/Nine Mound Road corridor on Madison's west side, the planned Belle Fontaine Boulevard in Middleton, Portage Road on the north side, and Egre Road (including planning extension to US 151) in Sun Prairie. The Grand Avenue/Reiner Road/Sprecher Road/CTH AB corridor on the east side is anticipated to function as a principal arterial in the future.

Recommendations and Supporting Actions		Timeframe	Implementing Party
2	Build a well-connected network of regional roadways to accommodate future growth and avoid the need for overly wide streets and intersections that create barriers for pedestrians and bicyclists.		
A	Conduct detailed planning for new collector streets and utilize official mapping, right-of-way dedications, and other methods to preserve existing and planned regional roadway corridors for potential expansion.	Ongoing	Local governments
3	Incorporate complete streets and green streets concepts for regional and local roadways.		
A	Utilize evaluation criteria and scoring guidelines for selecting MPO funded projects that encourage the inclusion of complete and green streets elements.	Ongoing	MPO
B	Adopt and implement a formal complete streets policy.	1-5 years	WisDOT, Dane County, Local governments

<u>Expand the regional roadway system strategically to address critical bottlenecks and accommodate future growth.</u>
Household and employment growth and development and travel trends, such as increased suburb-to-suburb travel, have led to increasing traffic volumes and congestion levels on the regional roadway system. If conditions continue to get worse, delays caused by congestion will negatively affect the region's economic competitiveness and quality of life.

Traffic volumes have increased the most on the Beltline, the Interstate, and other circumferential arterials such as CTH K, WIS 19, and Stoughton Road (US 51). Volumes have also spiked on radial arterials leading to the Beltline and Interstate system, including Verona Road (US 18/151), Fish Hatchery Road, and US 151. The Beltline exhibits by far the highest congestion levels. Other arterial roadway corridors with high congestion levels include: University Avenue, Johnson/Gorham Streets, East Washington Avenue, Fish Hatchery Road, Verona Road, and CTH M. Projects are underway to provide needed capacity in the Verona Road and CTH M corridors, while studies are underway to develop long-term solutions in the Beltline and Stoughton Road corridors.

In addition to addressing existing traffic congestion, future projected traffic from planned growth must also be accommodated. A regional travel demand model is used to forecast future travel based on forecast growth and assumed changes to the roadway and transit system. An iterative process was used whereby the planned future transportation system - including Bus Rapid Transit, planned new two-lane collector streets, and street extensions - was modeled first to determine its ability to accommodate expected traffic prior to consideration of new capacity expansion projects on the periphery.

Major local arterial expansion projects identified as needed to serve developing or planned new development areas include: Pleasant View Road; CTH PD west of CTH M; Reiner/Sprecher/CTH AB corridor; CTH T (N. Thompson Drive to Reiner Rd.), and the extension of Lien Road. It is recommended that new arterial streets with more than two travel lanes generally include medians, where possible, with appropriate openings for turning movements and turn lanes. Access management strategies, such as restricting driveway access, should also be used for arterial streets. These and other design strategies provide for more efficient travel and improve safety.

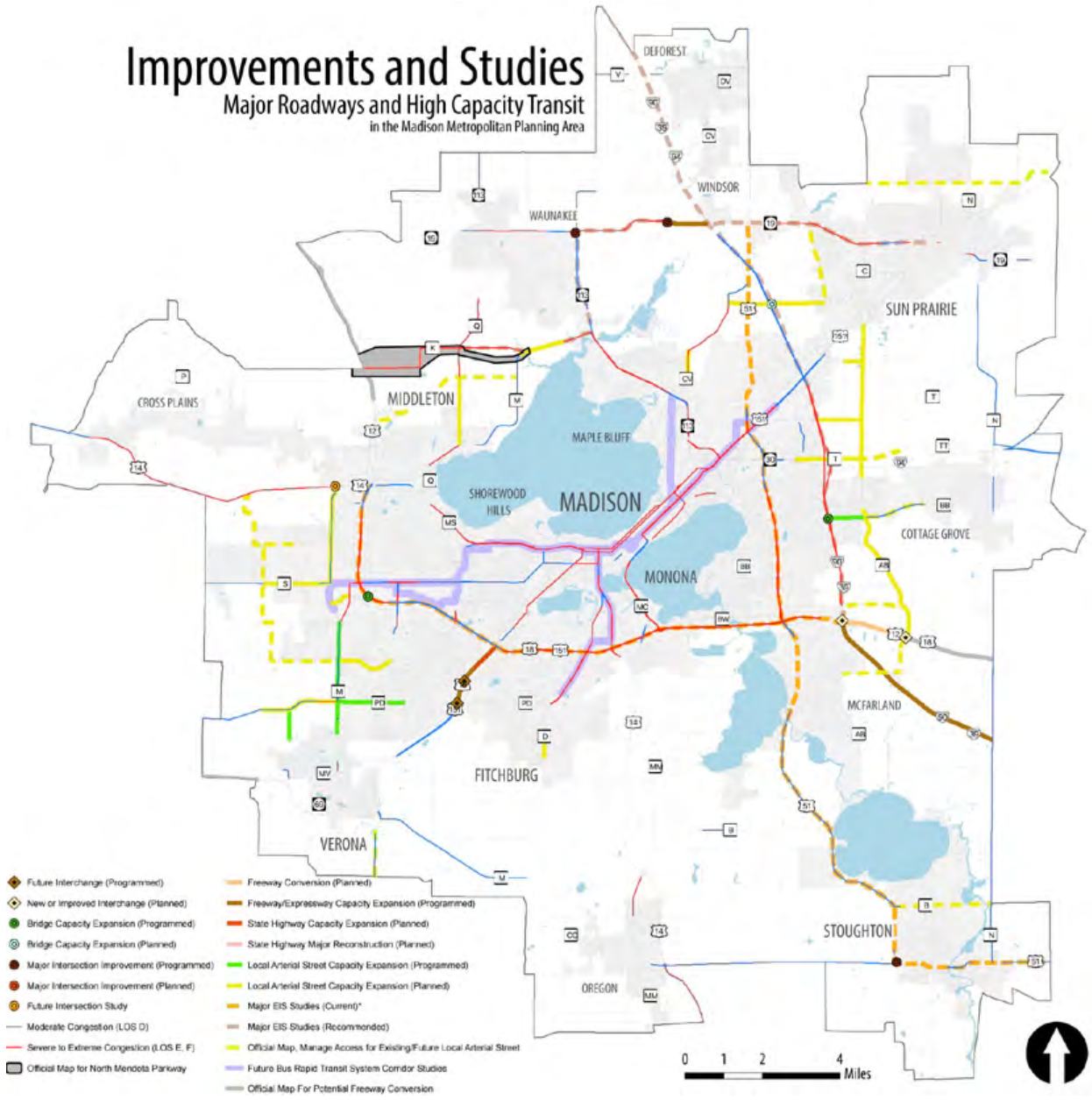


Figure 5-2: Major Roadway and High Capacity Transit Improvements and Studies.

Other than the programmed Verona Road (US 18/151) and Interstate 39/90 projects, the only other state highway capacity expansion projects included in the plan at this time are: Beltline/Interstate interchange, which is technically part of the Interstate expansion project; and US 12/18 freeway conversion with new CTH AB interchange, which is Phase 3 of the Beltline/ Interstate interchange project. Additional state highway capacity expansion project recommendations are expected to come out of the ongoing major corridor studies of Stoughton Road (US 51) and the Beltline (US 12/14/18/151). A future study is recommended for both the WIS 19/WIS 113/CTH M (North Mendota Parkway) and I-39/90/94 Interstate corridors. Because the scope of improvements in these corridors is unknown and funding has not been identified, the corridors are listed as studies. Once the studies are completed, the scope of improvements identified, regional agreement reached on them, and funding determined to be available in the future, the projects will be amended into the plan.

Figure 5-2 illustrates and Figure A-1 in Appendix A lists recommended major capacity expansion, intersection, interchange,

and bridge widening projects as well as major state highway corridor studies. Section 1 of Figure A-1 in Appendix A lists programmed projects for 2017-2020 and Section 2 lists additional planned projects grouped into two 15-year time periods (2021-2035, 2036-2050). The actual timing of the planned projects will depend on future development and traffic growth, impacts of congestion management strategies, system preservation needs, available funding, and other factors. Figure 5-2 highlights remaining areas of high peak period traffic congestion on the arterial roadway system that will need to be addressed with congestion management strategies as part of the regional Congestion Management Process.



Section 5 of the Figure A-1 in Appendix A includes a short list of "illustrative" major capacity expansion projects that are not part of the fiscally constrained, federally recognized plan. These include the two ongoing major state highway corridor studies of the Beltline and Stoughton Road, the environmental assessment study of the US 51 corridor study, which includes a segment west of Stoughton proposed for expansion, and the western segment of the North Mendota Parkway project on new alignment between CTH M and US 12 along with CTH CV and Q. Inclusion of these projects in the federally recognized plan is dependent upon completion of the environmental studies and demonstration that funding is likely to be available for them.

Recommendations and Supporting Actions		Timeframe	Implementing Party
4	Expand regional roadway system capacity to address critical bottlenecks and accommodate future planned growth consistent with RTP goals and policies.		
A	Continue or initiate detailed planning, design, and construction of state and local arterial capacity roadway, bridge, and interchange projects shown in Figure 5-2 and listed in Figure A-1 as needed with consideration given to project phasing where appropriate.	Ongoing	WisDOT, Dane County, Local governments
B	Complete study of the Beltline/Interstate interchange. Upon completion of accepted EIS, advance recommended alternative, with consideration given to phasing, compatibility of the design with potential Beltline/Stoughton Road interchange improvements, and planned US 12/18 freeway conversion east to CTH AB.	1-10 years	WisDOT
C	Complete major corridor studies of the Beltline and Stoughton Road/US 51. Upon completion of accepted EISs, seek enumeration as Majors projects and advance recommended alternatives using a phased approach. Continue to implement short-term TSM, safety, and multi-modal improvements in the corridors in the interim until Majors program funding is secured.	1-10 years	WisDOT
D	Complete environmental assessment and refine the design for the preferred alternative for the US 51 (McFarland to Stoughton) corridor, which includes reconstruction of most of the roadway, intersection improvements, and expansion to 4 lanes between WIS 138 and CTH B. Upon completion, seek enumeration as Majors project or alternative funding and advance project using a phased approach. Implement safety and TSM improvements and maintenance work in corridor in the interim if Majors program or other funding is not secured.	1-10 years	WisDOT
E	Initiate major study of the WIS 19/WIS 113/CTH M corridor to identify the long term solution to existing and future congestion and safety issues in the east-west corridor north of Lake Mendota. Officially map the corridor and initiate detailed planning of the recommended alternative, including appropriate phasing and funding strategies. Continue in the meantime to implement TSM, safety, and multi-modal improvements.	1-10 years	WisDOT, Dane County, MPO
F	Identify the appropriate limits and initiate study of the I-39/90/94 corridor north of the Beltline to address safety, operations, and congestion issues and in the meantime implement TSM and safety improvements.	1-10 years	WisDOT, MPO

Continue to pursue safety improvements. Traffic safety affects the metro area on many levels. Crashes cause personal tragedy, lost productivity, rising insurance costs, increased costs for police, emergency medical, and other social services, and also disrupt the movement of people and goods in the region. Safety concerns can also prevent people from choosing to walk or bicycle.

User behavior is a contributing factor in nearly every crash. For example, alcohol and drugs were a contributing factor in 57% of the county's fatal crashes between January 2010 and December 2015. Excessive speed, aggressive driving, and driver inattention are other common contributors to serious crashes. Other factors contributing to crashes are roadway and environmental conditions and in some cases vehicle failure. The types and designs of roadways can help minimize the potential for crashes and the likelihood of serious injury in the event of a crash.

Motor vehicles today are the safest they have ever been, with many features to protect the occupants in the event of a crash. The advent of connected vehicle technology is now shifting the focus of efforts to crash avoidance. Connected vehicle applications allow vehicles to "talk" to each other (V2V) and to roadway infrastructure (V2I) such as traffic lights, stop signs, and work zones. Using this information, vehicles can identify risks and provide warnings to drivers to avoid imminent crashes or even automatically take over driving functions such as braking. The National Highway Traffic Safety Administration (NHTSA) estimates that safety applications enabled by V2V and V2I technology could eliminate or mitigate the severity of up to 80 percent of non-impaired crashes at intersections and while changing lanes.



Source: Madison Fire Department

Recommendations and Supporting Actions		Timeframe	Implementing Party
5	Address safety needs on the regional roadway system through a comprehensive "3-E" approach that includes implementation of cost-effective engineering counter measures (i.e., roadway reconfiguration, new or modified traffic control devices, etc.), education, and enforcement.		
A	Implement WisDOT's 2014-2016 Wisconsin Strategic Highway Safety Plan (SHSP) and future updates to the plan.	Ongoing	WisDOT, Dane County, local governments, state agencies, law enforcement agencies, private organizations
B	Undertake planning process to identify regional roadway corridors and intersections with the highest crash rates and conduct further detailed study of these locations to identify countermeasures and prioritize projects for federal and state Highway Safety Improvement program funding.	1-5 years	MPO, Dane County, local governments
C	Continue efforts to implement short-term safety-related and TSM improvement recommendations from preservation/safety studies in state highway corridors, including US 14 (West), WIS 19, and WIS 138.	Ongoing	WisDOT
D	Develop and implement access management plans and standards for existing and future arterial roadways as development and street reconstruction occur.	Ongoing	WisDOT, Dane County, Local governments
E	Continue to implement cost-effective changes to traffic signals and signs that have been found to reduce crashes (e.g., use of light emitting diode (LED) lighting, overhead street signs on arterials, etc.).	Ongoing	WisDOT, Local public works/traffic engineering agencies
F	Officially map the US 12 (Parmenter St. to WIS 19 West), US 12/18 (Interstate to CTH N), and US 18/151 corridors for potential future freeway conversion based on recommended study alternatives. Continue to implement interim access management improvements, with future conversion dependent upon ongoing needs assessment and available funding.	Ongoing	WisDOT
G	Continue to expand state and local safety education efforts, including neighborhood-based initiatives.	Ongoing	WisDOT, local governments, non-profit organizations
H	Continue to support and expand local traffic enforcement activities such as use of local traffic teams and undertaking special enforcement initiatives.	Ongoing	Dane County and local law enforcement agencies
6	Address security needs related to the regional roadway system.		
A	Update the vulnerability assessment of critical transportation infrastructure in the state as part of development of the State Highway Investment Plan. Monitor identified facilities and make improvements as needed.	Ongoing	WisDOT
B	Complete current update and update as necessary Dane County Hazard Mitigation Plan to reduce risk of disruptions to the regional roadway system due to severe weather conditions, flooding, terrorism, hazardous material spills, civil disorder, climate change, and other events.	1-5 years	Dane County, Local governments
C	Initiate study to identify transportation facilities that are susceptible to flooding, identify alternate routes when flooding occurs, and identify improvements to make the facilities more resilient to flooding.	1-5 years	MPO, Dane County, Local governments
D	Update the county's Emergency Evacuation Plan, as necessary.	1-5 years	Dane County

Simplify navigation of the regional roadway system. There are numerous instances on the regional roadway system where the name of a roadway changes due to crossing jurisdictional boundaries or due to another historic anomaly. Instances such as the one illustrated below should be rectified to ensure that wayfinding is simple for residents, tourists, and freight carriers alike.



This roadway's name changes from Portage Road to Rattman Road to American Parkway and finally to Nelson Road within a 4 mile stretch. Source: Google Maps.

Recommendations and Supporting Actions		Timeframe	Implementing Party
7	Address roadway naming inconsistency along corridors.		
A	Initiate a study of regional roadway naming conventions to simplify wayfinding in the region.	1-5 years	MPO

PUBLIC TRANSIT

The short- and medium-term needs of the Madison area transit system are identified and well documented in the current *Transit Development Plan for the Madison Urban Area* and *Madison Transit Corridor Study – Investigating Bus Rapid Transit in the Madison Area*. The transit element of the Regional Transportation Plan builds upon these planning efforts to identify a long-term vision for the regional transit system.



Figure 5-5 on page 5-13 illustrates this future planned transit network. With implementation of the planned transit network, the number of average weekday boardings on the system is projected to more than double from around 41,000 to 91,000 by 2050 with assumed growth, while the number of trips (excluding transfers) is projected to grow 80% to 74,000. This excludes supplemental school

service ridership. The larger increase in boardings compared to trips is due to the increased transfer rate with the BRT system and additional peripheral routes. BRT system ridership is projected at 26,300, 29% of the system total.

Implementation of the planned transit system would greatly increase job accessibility by transit. Figure 5-3 and 5-4 illustrate the percent of existing jobs that can be reached within 45 minutes (including walking and waiting time) using the existing and planned transit system.

While Figure 5-5 is the transit system vision, a significant new infusion of funding—most likely through creation of a regional transit authority providing a dedicated funding source—will be needed to achieve it. For more information, see Financial Analysis in Chapter 6.
The following describes the identified transit facility and service needs and recommendations with supporting actions to address them.

Implement a Bus Rapid Transit System and restructure routes accordingly.
MATPB and Metro Transit led the *Madison Transit Corridor Study* in 2013 using funding secured by the Capital Area Regional Planning Commission through a Sustainable Communities grant. The study identified four corridors that are suitable for BRT. BRT elements identified in the plan include frequent, direct, limited-stop service, branded buses, stations with level boarding, and off-board fare collection, and transit priority measures like bus lanes and transit signal priority. These corridor improvements will increase capacity and reduce travel times for transit riders throughout the Madison area, allowing Metro to reverse the recent downward

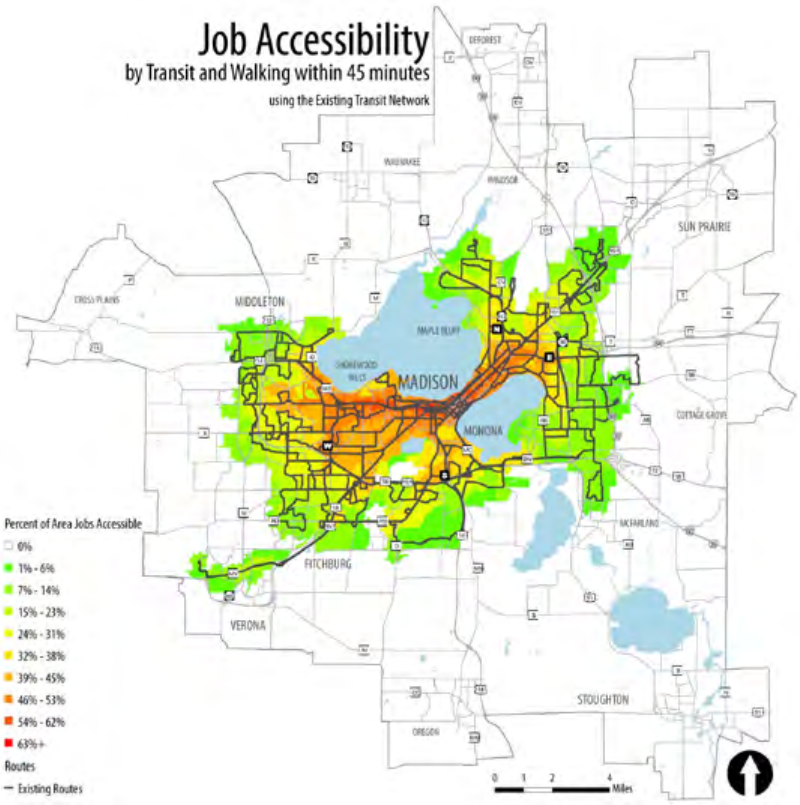


Figure 5-3: Job accessibility within 45 minutes by using existing transit system and walking.

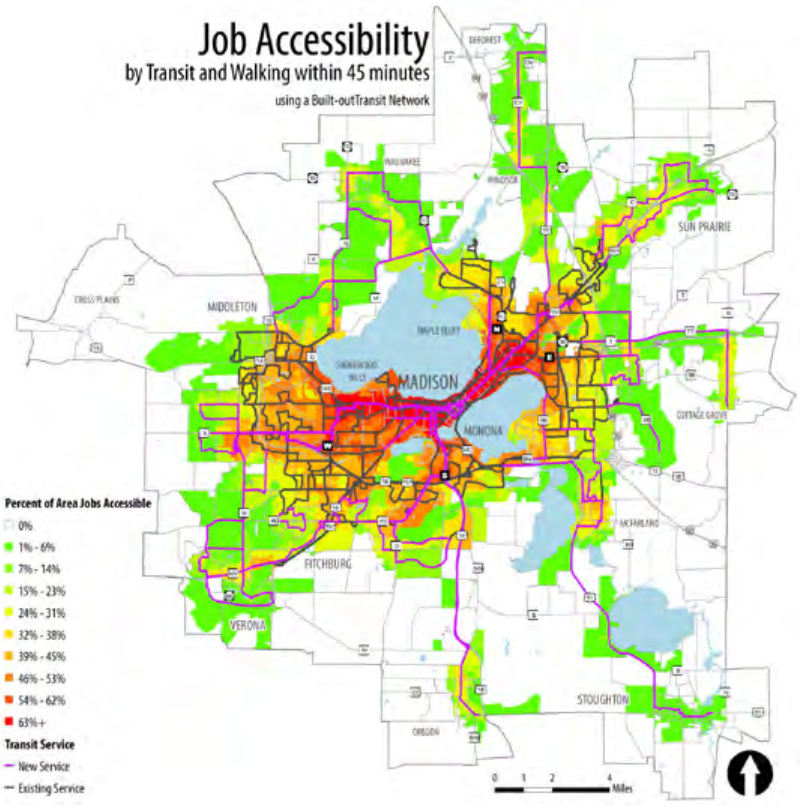


Figure 5-4: Job accessibility within 45 minutes by using planned transit system and walking.

trend in bus ridership over the past two years. Capital costs could be funded in large part through a federal Small Starts grant.

Policy-makers and planners in the Madison area have recognized the need for a large-scale investment in public transportation like light rail, commuter rail, and bus rapid transit for several decades. Planning documents in the 1980s showed a combination of light rail and bus rapid transit. In the 1990s and 2000s the focus shifted to commuter rail using underused and abandoned rail corridors. The Transport 2020



Example BRT configuration. Source: CDOT

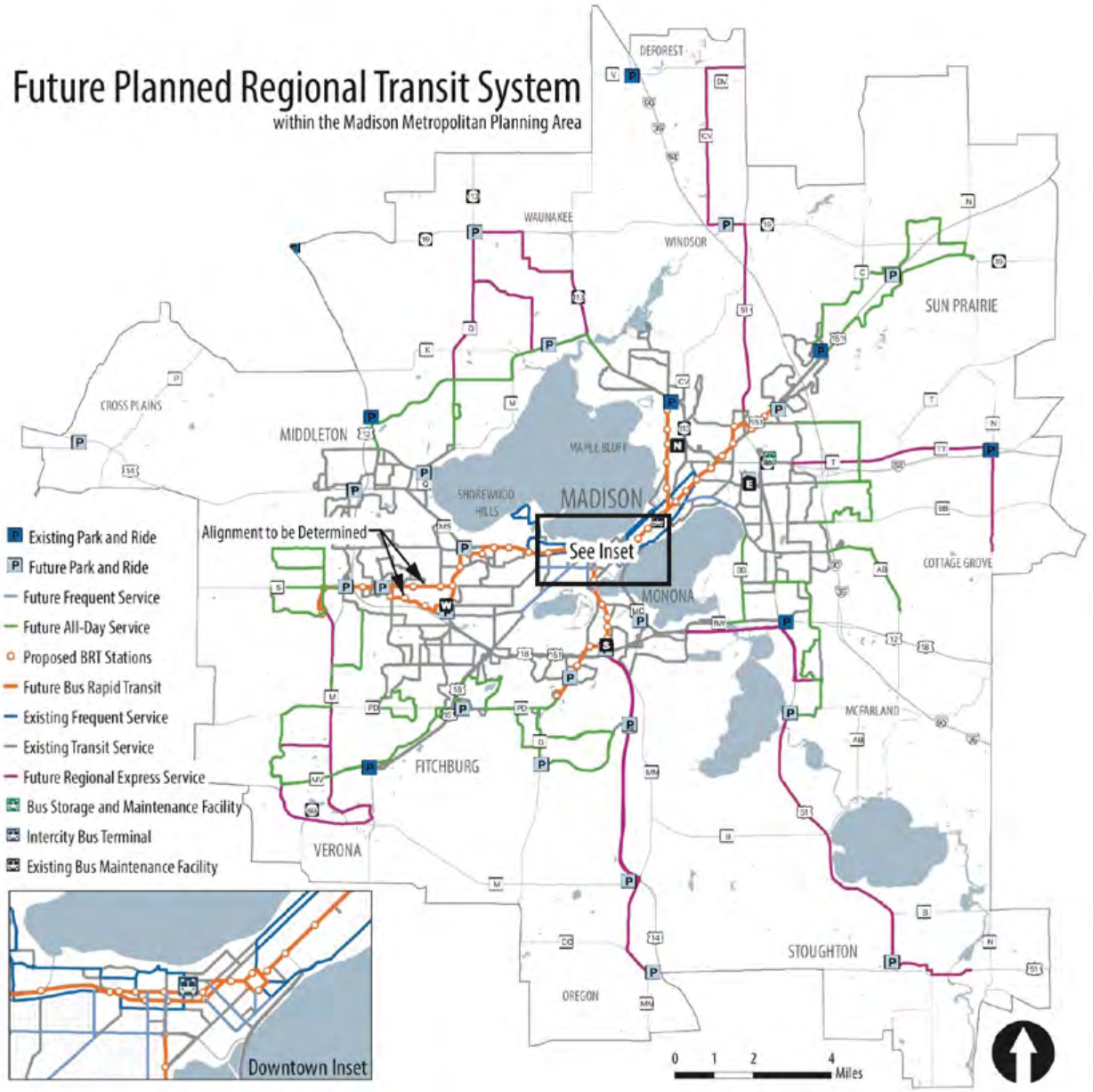


Figure 5-5: Future Planned Regional Transit System

study culminated in a locally preferred alternative in 2008 including a hybrid light rail / commuter rail line in the east-west corridor between Middleton and northeast Madison. The project was put on hold due to lack of funding.

BRT is essentially rail-like bus service, with many of the advantages of rail at a small fraction of the cost. The introduction of a BRT system will necessitate a restructuring of the bus routes on a scale similar to the 1998 restructuring when the transfer point system was adopted. Local routes will be adjusted to reduce duplication with BRT and provide better connections to the new high quality service. Besides better integration with BRT, restructuring routes will address other local transit needs, such as making the system easier to understand by replacing many overlapping low-frequency routes with fewer high-frequency routes.

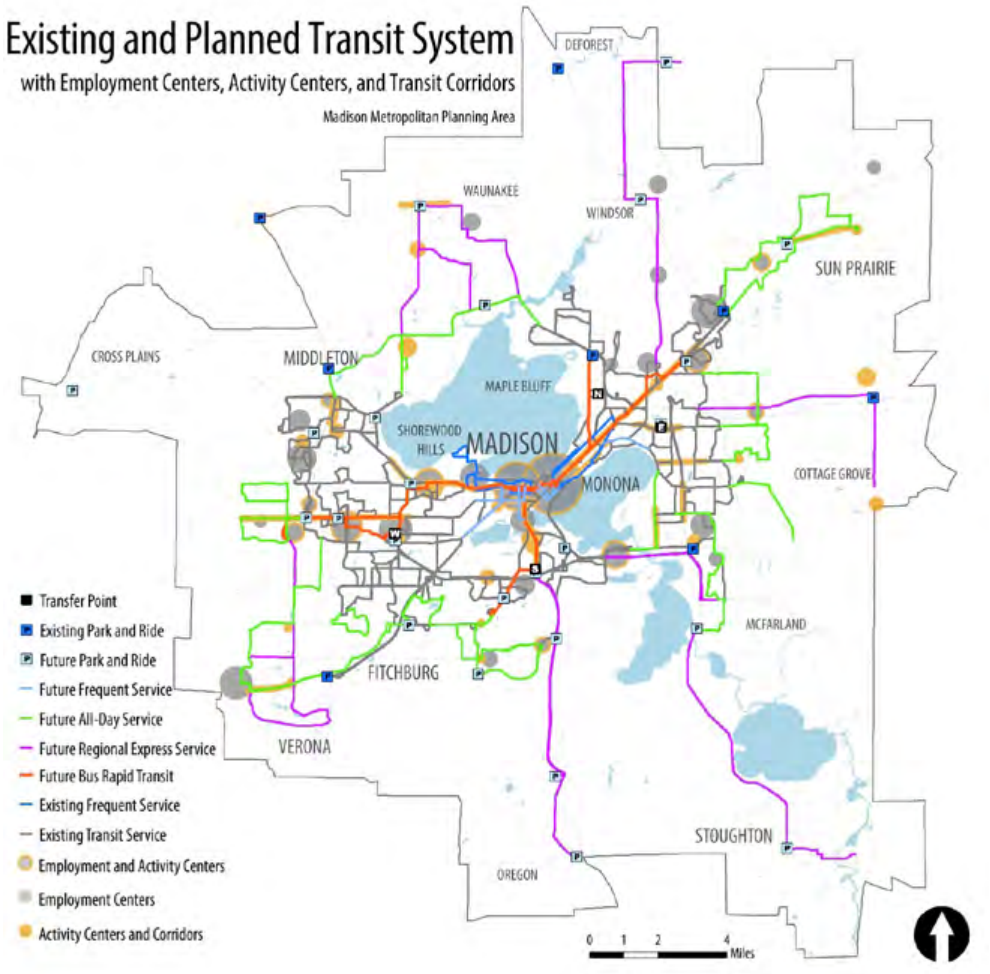


Figure 5-6 Existing and Planned Transit System with Employment Centers and Activity Centers and Corridors

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	**Implement a Bus Rapid Transit System.**		
A	Complete an alternatives analysis and project planning, leading to an initial BRT Project.	1-5 years	City of Madison and other Local Governments, Metro, MPO
B	Expand the BRT network to fulfill the BRT Vision in the Madison area.	5-15+ years	Cities of Madison and Fitchburg, Metro, MPO
C	Plan for the expansion of BRT into other corridors, including Middleton, southwest Madison, Fitchburg, southeast Madison, and Sun Prairie.	15+ years	Metro, MPO, Local Governments
D	Expand the use of transit priority treatments, focusing on the BRT corridors.	Ongoing	Metro, MPO, Local Governments

Improve the existing local bus network by reducing travel times, increasing frequency, increasing capacity, providing service to new neighborhoods, and enhancing first and last mile connections. With a growing service area and limited service outside peak periods and on weekends, transit travel times for longer distance trips are far greater than driving. Many cross-town trips take an hour or longer due to routing through neighborhoods and transfers. Travel times must be shortened and more direct service added throughout the day.



Related to the need for reduced travel times is a need increase service frequency in some parts of the network in the greater Isthmus area. High-frequency routes are generally defined as those in which a rider does not have to check a schedule before traveling to a transit stop – generally 15 minute service or better. Currently, a limited number of neighborhoods in the region are served with high-frequency service and are predominantly located in central Madison. High density corridors need consistent, frequent local all-day service. Such corridors include Monroe Street, Regent Street, Mills Street, Broom and Bassett Streets, and Atwood Avenue.

Along with frequency improvements, capacity improvements must be made on heavily traveled routes. Metro operates a fixed-route fleet of 40-foot transit coaches that seat about 35 and allow for about 20 standees. Several routes routinely suffer from overcrowded conditions, including instances where passengers are passed by because the bus is full. Constructing the Nakoosa Trail bus storage and maintenance facility will allow Metro to increase its fleet and introduce larger articulated buses which will be required to accommodate future high-capacity transit, new all-day service, and regional routes.

When new neighborhoods are fully developed, full transit service should be provided. Some neighborhoods in peripheral Madison, Middleton, Fitchburg, and Verona currently only have service during weekday peak periods and require service throughout the day to provide access to jobs with nontraditional schedules as well as trips serving other purposes. Sun Prairie arguably has the most urgent need for all-day fixed-route bus service. With a population of about 30,000, Sun Prairie is now served by a publicly subsidized shared-ride taxi system. While popular, this system is strained by capacity limitations and does not provide convenient and affordable service to Madison.

Finally, the transit system must be accessible for those that live and work near transit stops, but outside of reasonable walking distance. Connecting transit routes provide a good option, but their typical low frequencies and circuitous routes, combined with transfers, drive up travel times. Further, they sometimes have low usage and can be expensive to operate, providing relatively low utility to the community.

Alternative first mile/last mile strategies are emerging that may be a viable alternative to new fixed-route service in low-density, peripheral areas. Improving pedestrian and bicycle access to transit stops may provide riders with increased access to the transit network. Bike-share programs like BCycle are an option but they require a high density of docking stations to be successful and are not an option for everybody, especially during cold and rainy weather. Public shared-ride taxi systems and other rideshare schemes may be effective in very low demand areas.

Point-deviation routes have not historically been widely deployed in the Madison area, but with Madison's peripheral neighborhoods growing and stretching Metro Transit's resources, they may fill a limited niche. Point-deviation routes typically follow a route with a conventional schedule, but are allowed to deviate slightly in order to serve riders. In low-density areas, point-deviation routes have the potential to serve larger areas within a fixed budget compared to fixed routes. They also have

the potential to reduce the number of transfers for long cross-town trips, which are more likely to be relied upon by low-income and minority riders, according to the 2015 Metro Transit Onboard Passenger Survey.

In the example route shown in figure 5-7, a bus would travel between the South Transfer Point and West Towne Mall along the dark blue line, but could make reasonable deviations to serve the light blue shaded area. Such a route may provide cost-effective all-day service to neighborhoods that currently have no all-day service, with reasonable travel times.

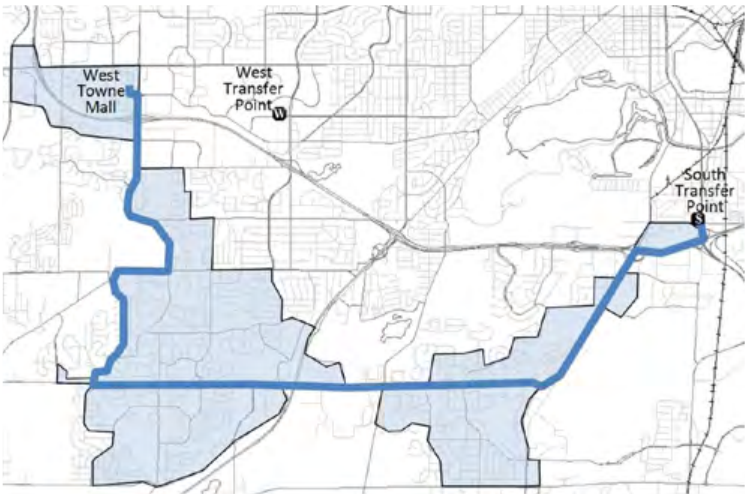


Figure 5-7: An example of route deviation.

Recommendations and Supporting Actions		Timeframe	Implementing Party
2	Improve the local bus network.		
A	Continue to optimize the local bus network to maximize its utility with available resources.	Ongoing	Metro, MPO
B	Measure and monitor the effects of service changes on low-income and minority populations.	Ongoing	Metro, MPO
C	Improve integration with bordering transit systems in Monona and Sun Prairie.	Ongoing	Metro, MPO
D	Reduce travel times and simplify service.	Ongoing	Metro
E	Expand and enhance the network of frequent local service in central Madison.	5-15 years	Metro
F	Make changes to local routes when BRT is opened in order to reduce duplication and enhance connections.	5-15+ years	Metro, MPO
G	Improve and expand data collection and analysis to support service planning.	Ongoing	Metro, MPO
3	Add service in developing neighborhoods.		
A	As developing neighborhoods are built out, enhance limited-service routes so that they provide regular service throughout the day.	Ongoing	Metro, Local governments
B	Add new all-day service in unserved peripheral neighborhoods and suburban communities such as Sun Prairie, McFarland, and Verona.	5-15+ years	Metro, Local governments
4	Enhance transit stops with improved pedestrian/bicycle access and amenities.		
A	Coordinate with municipalities, businesses, and neighborhood associations to plan and provide funding for stop improvements.	Ongoing	Metro, MPO, Local governments
B	Utilize TID funding and other alternative financing mechanisms to fund stop improvements.	Ongoing	Local governments
C	Plan and reserve space for transit stops/stations as part of new developments where appropriate.	Ongoing	Local governments
5	Utilize alternative service delivery models to serve low-demand areas.		
A	Analyze bus route productivity and identify service with low use and high travel times that may better serve neighborhoods with alternative transit models.	1-5 years	Metro, MPO
B	Develop peripheral routes with small vehicles that can deviate from their route with the goal of providing service in low density areas at a lower cost and reducing multiple-transfer trips.	1-5 years	Metro, MPO, Private Providers, Non-Profits
C	Investigate using transportation network companies and shared-ride taxi service to connect to transfer points, BRT, and regional express service.	1-5 years	Metro, MPO, Private Providers, Non-Profits
D	Plan for the use of driverless shuttles in low-density transit markets and niche areas like business parks and campuses.	1-5 years	Madison Traffic Eng, UW, Metro, MPO

Manage and improve the quality of transit capital assets. Aging infrastructure needs to be maintained and updated. Transit buses last 12 to 15 years and need to be regularly replaced. Metro's four transfer points were constructed in 1998 and will need to be replaced or in some cases relocated and/or expanded by 2050. Metro currently uses a diesel-powered fleet, about 10% of which is hybrid diesel-electric. Transitioning to a low-emission or emission-free fleet will reduce Metro's dependency on petroleum fuel, improve public health, air quality, and the pedestrian environment in bus route corridors. Metro is in the process of developing a comprehensive transit asset management plan in accordance with new federal rules. The plan must cover all transit agency assets, including vehicles, facilities, equipment, and other infrastructure.

Recommendations and Supporting Actions		Timeframe	Implementing Party
6	Maintain, expand, and enhance bus rolling stock and supporting facilities.		
A	Renovate and remodel the existing Metro maintenance/bus storage facility and address maintenance issues.	1-5 years	Metro
B	Build a new satellite bus facility on Nakoosa Trail to accommodate a larger fleet, including articulated buses and electric buses.	1-5 years	Metro
C	Replace buses on a regular cycle to ensure reliability and comfort.	Ongoing	Metro
D	Expand the use of alternative fuel vehicles with a goal of having a fully emission-free electric fleet by 2050.	Ongoing	Metro
E	Introduce articulated 60-foot buses to the fleet to reduce overcrowding and accommodate BRT.	5-15 years	Metro

Improve regional access to the transit network. Regional transit service in the Madison area is extremely limited with bus service confined to some of the contiguous municipalities bordering Madison and Verona. Workers living in DeForest, Windsor, Waunakee, Sun Prairie, Cottage Grove, McFarland, Stoughton, Oregon, and Cross Plains that work in the Madison area have effectively no public transit options outside of commuting to a park-and-ride lot or transfer point within Madison.

A new regional express service network will address the needs of people in these communities to commute to many jobs, particularly in central Madison. It will also provide access to people living within the existing transit service area to jobs in suburban employment centers. Employers in some of the communities have indicated they have difficulty filling entry level, lower wage jobs because of the lack of transit service. With direct, limited-stop service within Madison, the regional service will be time-competitive with driving and carpooling.

New park-and-ride lots will help supply passenger demand for the new regional express service. Many suburban communities are not well laid out for one route to serve all neighborhoods – many commuters will be best served if they have the option of making a short trip by auto or bicycle and using transit for the majority of their trip. Park-and-ride lots may be newly constructed, publicly owned lots, or private lots (e.g., at a shopping center) with lease agreements.

Recommendations and Supporting Actions		Timeframe	Implementing Party
7	Implement a regional express bus network.		
A	Expand and optimize the existing regional express service to Middleton and Verona.	5+ years	Metro, Local governments, MPO
B	Operate new routes primarily during the morning and afternoon peak periods to suburban Madison communities.	5-15 years	Metro, Local governments
C	Optimize the regional express transit service to provide service from Madison to suburban job centers as well as from residential areas to central Madison.	5-15 years	Metro, MPO, local governments
D	Provide limited stop service within City of Madison to provide fast service within Madison and connections to BRT and local service.	5-15 years	Metro, Local governments

Recommendations and Supporting Actions		Timeframe	Implementing Party
8	Expand park-and-ride facilities in conjunction with BRT and express services.		
A	Investigate opportunities to share space at shopping centers, churches, and other private facilities as well as public facilities such as parks, where appropriate. See Fig. 5-5, Planned transit System.	1-5 years	Metro, MPO, Local governments
B	Explore partnerships with local communities and agencies to maintain park-and-ride facilities.	1-5 years	Metro, Local governments

Implement a regional transportation entity to ensure financial solvency of the transit agency. A regional funding mechanism such as a regional transit authority with taxing authority is necessary to implement the vision of expanded transit service in the Madison region, including construction and operation of a bus rapid transit system and expansion of bus storage and maintenance facilities. A regional governance structure would also improve service efficiency and allow for more equitable decision-making.



Recommendations and Supporting Actions		Timeframe	Implementing Party
9	Implement a regional transit entity with stable funding and representative governance.		
A	Ensure that funding for transit remains equitable and that decisions are made fairly, with communities represented appropriately.	Ongoing	Metro, Local governments
B	Explore alternatives to supplement or replace the property tax for local public funding, including a vehicle registration fee and sales tax (if state enabling legislation passed).	1-5+ years	Local governments
C	Implement a new regional transit authority or district with the mission of providing regional transit service if state enabling legislation is passed.	1-5+ years	Metro, Local governments

BICYCLES

Although the region's bikeway network is well developed compared to peer communities, gaps in the network persist. Bicycle planners need to consider the needs of bicyclists of all abilities, including young and old people, and people who are not comfortable biking in traffic.

The 2015 Bicycle Transportation Plan identified streets that do not have bicycle accommodations or have insufficient bicycle accommodations. However, as these facilities are generally evaluated when opportunities arise, such as street reconstruction, they were not prioritized. This plan goes one step further and identifies missing facilities that represent major gaps and barriers in the bikeway network.





Expand the regional shared-use path network and retrofit and expand on-street accommodations. The Bicycle Transportation Plan describes a network of major regional shared-use paths that will connect communities with high quality biking infrastructure. Examples of regional paths include the popular Capital City Trail and Southwest Path. Although they are long and continuous, they also serve as high-volume bike arterials in the central city.

The Lower Yahara River Trail will open to the public in 2017 with a new bridge and boardwalk over Lake Waubesa, substantially shortening and easing a bicycle trip between Fitchburg or central Madison and McFarland. This new facility is planned to be extended about 10 miles south to Stoughton. The City of Madison and Dane County are working to close the gap between the Capital City Trail in Madison and the Glacial Drumlin Trail in Cottage Grove, creating a complete route between Madison and Milwaukee.

Other major recommended regional paths include the Good Neighbor Trail to Middleton and to the west, a path around the north side of Lake Mendota, a path between Fitchburg and Oregon with a connection to the Capital City Trail, a path between Madison and Sun Prairie along the rail corridor, and paths serving the north side connecting to Waunakee and DeForest. These paths will address the major regional deficiencies in the bike network, connecting neighborhoods and municipalities that are isolated for people traveling by bike.

On-street accommodations for bicycles are found on a number of regional roadways that serve high-volumes of motor vehicle traffic. In many instances, these facilities provide the most direct route to and from a variety of destinations. Providing safe on-street bicycle facilities ensure that more riders are able to comfortably ride on these regional roadways. The network should be expanded as roadway reconstruction projects occur and facilities should be considered whenever new arterial or collector streets are constructed.

Figure 5-8 illustrates and Figure A-2 in Appendix A lists the major regional priority shared-use path projects that will help complete the planned regional network and fill some important gaps in the network in the urban area. See page D-23 for a map of the complete bicycle network plan.

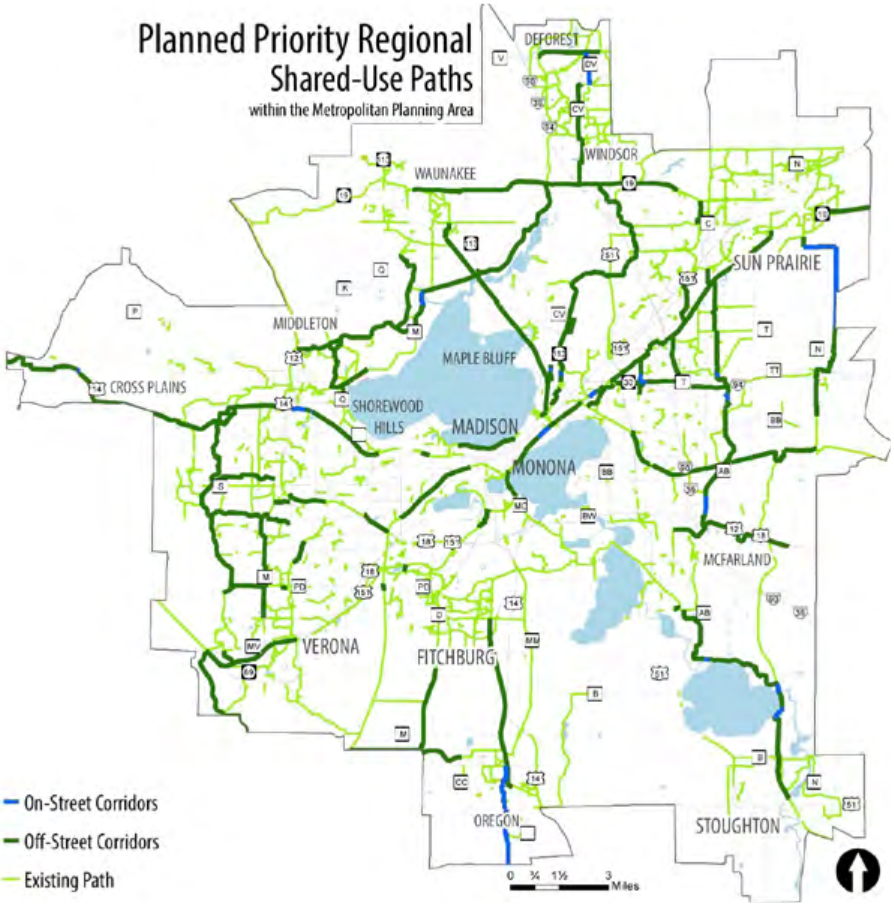


Figure 5-8: Planned Priority Regional Shared-Use Paths

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Expand the bikeway network with new shared-use paths and on-street facilities.		
A	Construct new off-street shared-use paths to complete the bikeway network envisioned in the Bicycle Transportation Plan.	Ongoing	Dane County, Local governments
B	Construct new shared-use paths in developing neighborhoods so that facilities are available as soon as new residents move in.	Ongoing	Dane County, Local governments
C	Retrofit existing corridors like railroad and utility rights-of-way with bicycle facilities as appropriate.	Ongoing	Local governments
D	Provide enhanced or premium bicycle facilities in key urban arterial corridors within right-of-way where feasible.	Ongoing	Local governments
E	Expand the use of bicycle boulevards, bicycle priority streets, and priority treatments at intersections.	Ongoing	Local governments
F	Prepare and implement local bicycle plans.	Ongoing	Local governments
G	Include paved shoulders of at least 4 feet in width on rural highways where appropriate and economically feasible.	Ongoing	WisDOT, Dane County
2	Maintain and modernize existing bicycle facilities.		
A	Repave and repair bicycle facilities with similar standards as collector streets.	Ongoing	WisDOT, Dane County, local governments
B	Include bicycle facilities on all new bridges and highway crossings.	Ongoing	WisDOT, Dane County, local governments
C	Use innovative bike facility designs that meet or exceed state and national guidelines.	Ongoing	Local governments
D	Develop and implement local policies and practices to clear snow, ice, and debris from bike facilities.	Ongoing	Dane County, Local governments

<u>Eliminate gaps and barriers in the bicycle network.</u>
Major facilities needed to complete the urban bikeway network are shown in Figure 5-9. The gaps and barriers analysis focused on urban areas that are fully developed and on identifying street and path corridors with existing demand for bicycling that can feasibly accommodate bicycle facilities when the opportunity arises. The analysis is intended to serve as an initial screening based on the existing and planned bikeway network.

A more detailed engineering evaluation is needed to determine how best to facilitate bicycles within the street corridors identified.

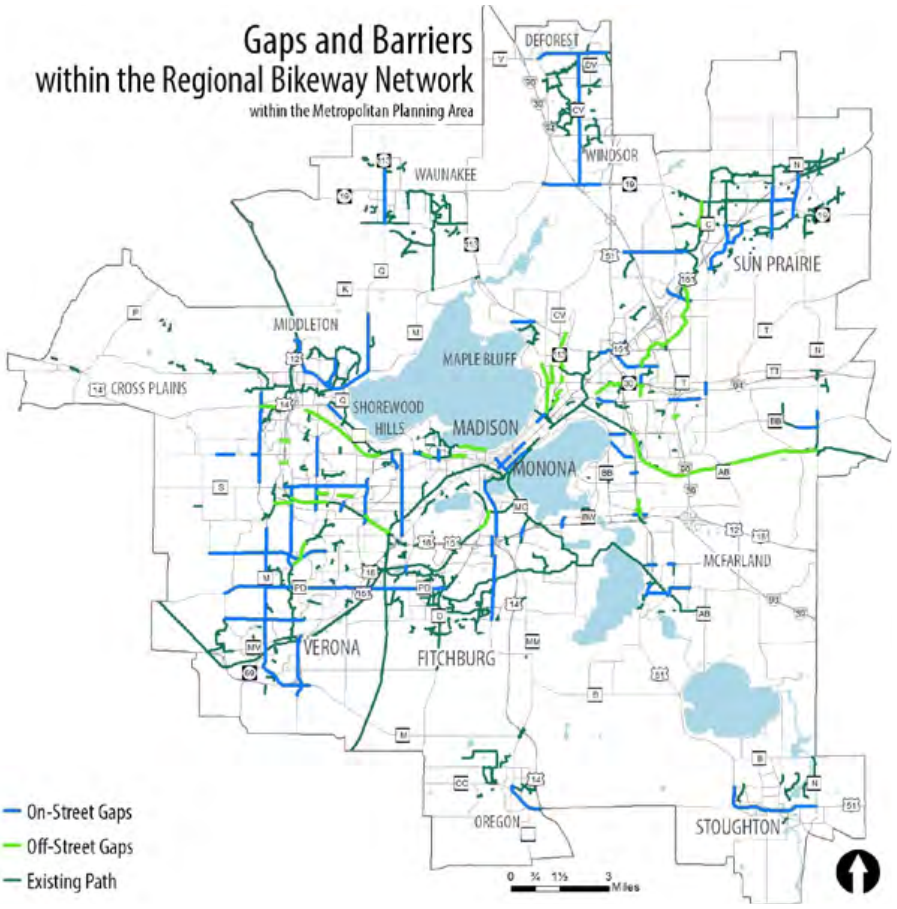


Figure 5-9: Gaps and Barriers within the Regional bikeway Network

While a detailed feasibility analysis of the identified corridors was not conducted, constrained street corridors with no available right-of-way and/or recently reconstructed streets are excluded.

The gaps and barriers are a occur in both on-street and off-street facilities. Fixing these gaps and barriers will help complete the bicycle route system envisioned in the Bicycle Transportation Plan. Figure 5-10 illustrates the planned primary regional route system.

Most of the on-street needs shown in the gaps and barrier map will likely be satisfied with bike lanes where none currently exist. Where feasible, these lanes may be buffered or protected.

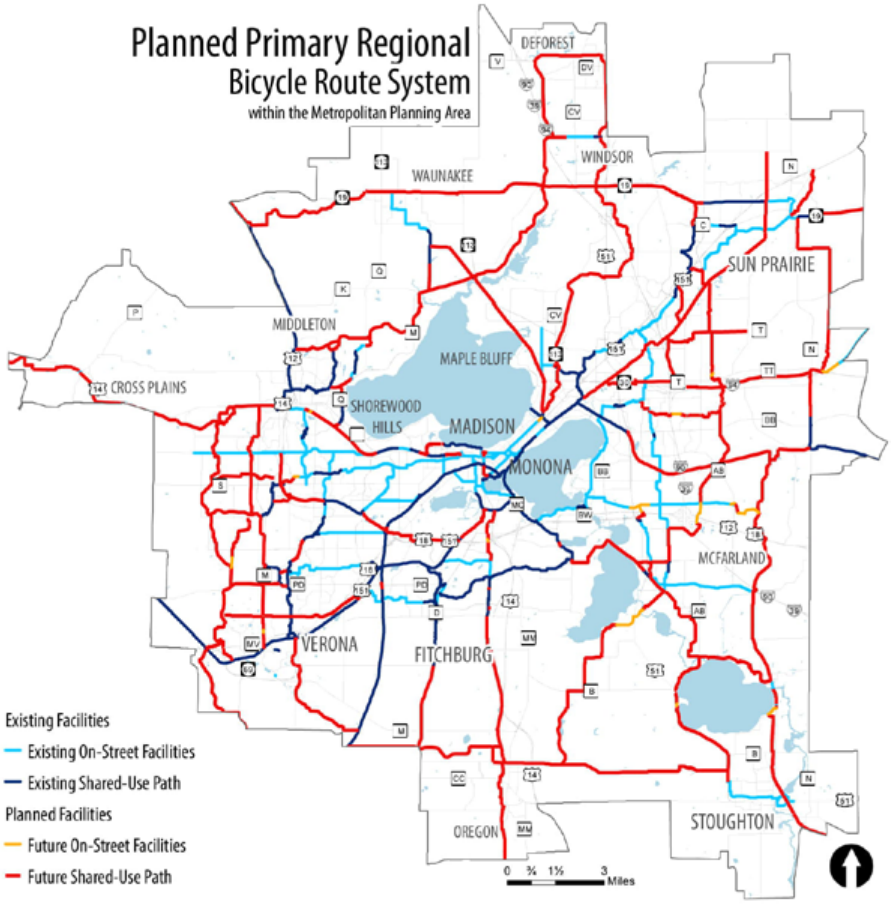


Figure 5-10: Planned Primary Regional Bicycle Route System

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	Eliminate bicycling barriers and hazards in the bikeway network.		
A	Close regional bikeway network gaps and address barriers (see Figure 5-9).	Ongoing	Dane County, Local governments
B	Evaluate intersections with a history of safety concerns or complaints, and plan and implement improvements.	Ongoing	WisDOT, Dane County, local governments
C	Complete the local street network where barriers prevent direct travel.	Ongoing	Local governments
D	Ameliorate conflicts between bikes and buses, delivery trucks, and pedestrians.	Ongoing	Local governments

Encourage bicycling by enacting bicyclist-supportive policies and ensuring bicyclist safety. To ensure that users of all abilities are comfortable using the bicycle network, appropriate facilities must be provided, but we must also ensure that both bicyclists and motorists are provided with ample education and encouragement. Also, intersections and corridors with high bicycle crash rates need to be studied to identify effective counter measures. These types of studies can also identify common patterns for crashes, which can be used to develop targeted education campaigns. Other user needs include adequate bicycle storage opportunities, access to bike sharing services, and adequate wayfinding.



Recommendations and Supporting Actions		Timeframe	Implementing Party
4	Provide adequate bicycle parking.		
A	Require bicycle parking as a condition of new development.	Ongoing	Local governments
B	Provide public bicycle parking in business districts, on campuses, and at high-use transit stations.	Ongoing	Local governments
5	Improve bicyclist safety through a "3E" approach .		
A	Conduct studies of intersections and other areas with high crash rates or documented safety issues to identify appropriate countermeasures.	Ongoing	Local governments, MPO
B	Update 1991 City of Madison study of vehicular crashes involving pedestrians and bicyclists, expanding it to the metro area, to obtain up-to-date information on common patterns for crashes. Utilize the information in crash prevention efforts.	1-5 years	MPO, City of Madison Traffic Engineering
6	Continue bike share, education, and bicyclist supportive policies.		
A	Continue supportive policies like producing bicycle maps and accommodating bicycle-themed events.	Ongoing	MPO, Local governments, NGOs
B	Implement wayfinding system for bicyclists using the recently developed Bicycle Wayfinding Design Guidelines for Dane County.	Ongoing	Dane County, Local governments
C	Expand the bike share program, working with the provider, by expanding the coverage and increasing the density of stations.	Ongoing	BCycle, Local governments
D	Support and expand education and encouragement programs that promote safety and encourage all residents to bicycle for commuting and other trips.	Ongoing	MPO, Local governments

PEDESTRIANS

Sidewalks are the preferred accommodation for pedestrians and provide many benefits, including safety, mobility, and healthier communities. Therefore, the pedestrian needs analysis started with identifying urban arterial and collector streets where sidewalks are missing from one or both sides, but are needed to serve existing development . This provided a starting point for prioritizing the most pressing needs. These street segments were then split into "Tier 1" and "Tier 2" categories.



Tier 1 sidewalk needs typically have a higher demand for walking based on the pedestrian walk access analysis (see Chapter 3) and are on streets with higher traffic speeds and volumes. Other qualitative factors were also considered. For instance, recently reconstructed streets and streets where a sidewalk is on one side, but most of the destinations are on the other side were generally put in the Tier 2 category. Figure 5-11 illustrates the Tier 1 and Tier 2 regional pedestrian network needs.

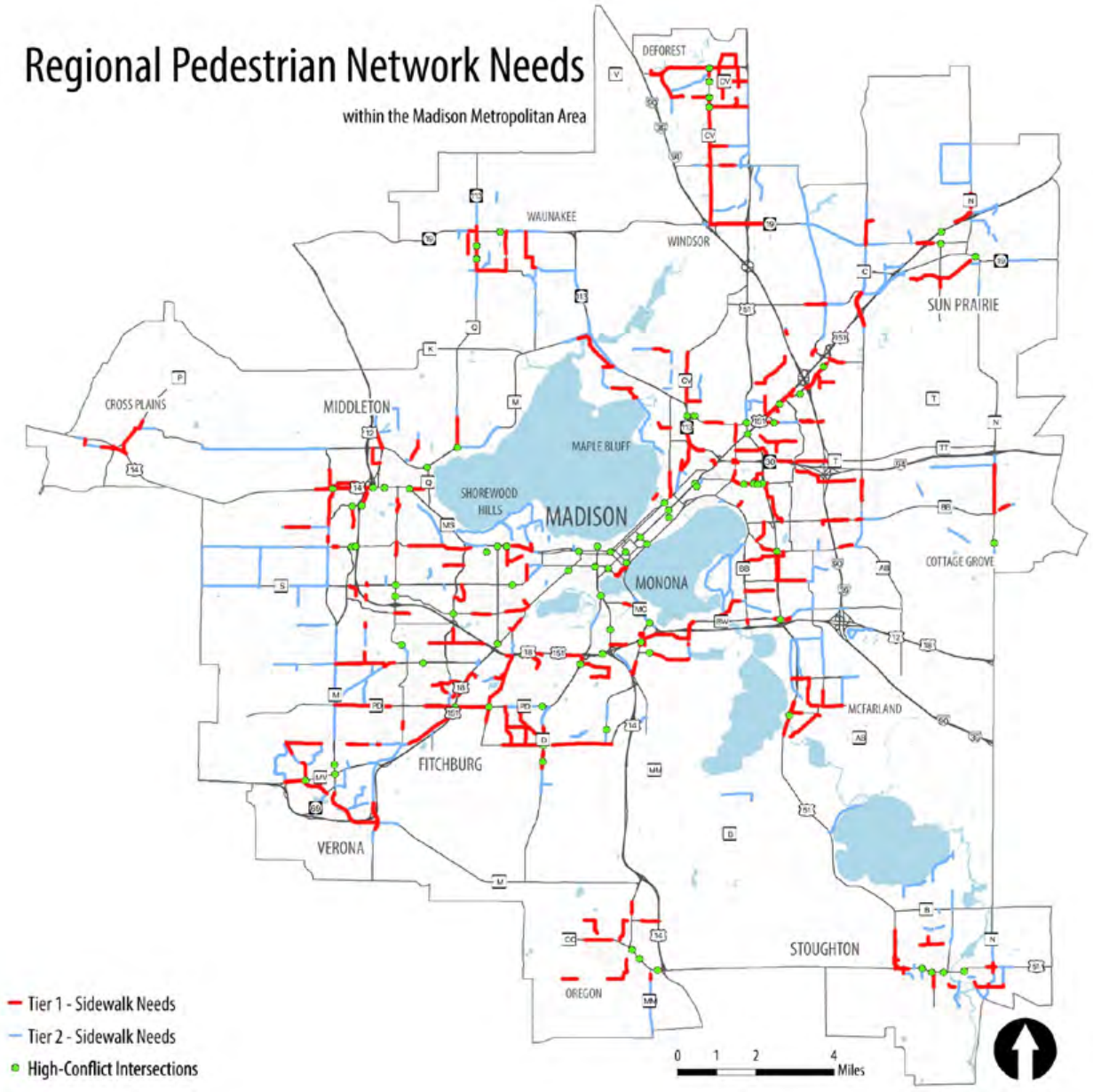


Figure 5-11: Regional Pedestrian Network Needs

Street crossing facilities such as curb ramps, crosswalks, and signals are the other major type of facility for pedestrians. Designing safe and convenient street crossings is extremely important for creating a pedestrian friendly environment. Appendix E includes a pedestrian toolbox that illustrates the different types of pedestrian facilities and treatments that can be used to encourage walking and provide for the safety of pedestrians. Of course, good facilities alone are insufficient without destinations within walking distance. Streetscape design is also an important part of creating walkable communities. Pedestrian-supportive land use is addressed above under Land Use and Transportation Integration. The following recommendations and supporting actions address the region's major pedestrian facility needs.

Construct sidewalks along all new urban streets and retrofit regional roadways with sidewalk accommodations. All urban streets that attract pedestrians normally benefit from having sidewalks.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Provide sidewalks and appropriate pedestrian amenities in developing neighborhoods.		
A	Require sidewalks on both sides of all streets in new urban developments.	Ongoing	Local governments
B	Adopt land use ordinances to ensure new developments provide for adequate pedestrian circulation and are integrated with adjacent land uses.	Ongoing	Local governments
C	Connect bordering, developing neighborhoods with sidewalks and shared-use paths.	Ongoing	Local governments
D	Prepare and implement local pedestrian plans.	Ongoing	Local governments
2	Retrofit regional streets with modern, safe pedestrian accommodations .		
A	Prioritize the addition of missing sidewalks on arterial and collector streets with higher demand for walking (See Fig. 5-11).	Ongoing	WisDOT, Local governments
B	Identify pedestrian needs and gaps, as well as safety problems, and implement solutions.	Ongoing	WisDOT, Local governments
C	Reduce cost share required of property owners to retrofit in sidewalks in existing neighborhoods.	Ongoing	Local governments
D	Prepare and implement ADA compliance plans to retrofit non-conforming facilities to ADA standards.	Ongoing	Local governments
E	Identify and install accessible pedestrian signal systems and other ADA accessibility treatments where necessary.	Ongoing	WisDOT, Local governments
F	Provide for a more comfortable pedestrian experience with wider sidewalks and appropriate separation on high-volume regional roads with pedestrian traffic.	Ongoing	WisDOT, Local governments

Improve the safety and usability of the pedestrian network. At the beginning and end of every trip, users of all modes are pedestrians. Thus, it is important to ensure a safe and usable pedestrian network. High conflict intersections should be examined to determine their need for pedestrian crossing improvements. The sidewalks should be maintained for year-round use, similar to roadways. In areas where roadway geometry and street designs cause unsafe pedestrian conditions, traffic calming devices should be installed to ensure pedestrian safety.

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	Improve safety and usability for pedestrians at intersections and crossings.		
A	Evaluate pedestrian improvements at major street crossings and implement as opportunities are available. See Fig. 5-11 identifying many of these high conflict locations.	Ongoing	Local governments, MPO
B	As intersections are designed and reconstructed, consider pedestrian safety improvements.	Ongoing	WisDOT, Local Governments
C	Use pedestrian design tools to improve crossings such as enhanced crosswalks, refuge islands, and rapid flashing beacons. See Pedestrian Facilities Toolbox in Appendix F.	Ongoing	WisDOT, Local Governments
D	Identify and prioritize new grade-separated crossings where streets and shared-use paths with substantial pedestrian traffic intersect with highways and other barriers.	Ongoing	WisDOT, Local Governments
4	Maintain sidewalks and pedestrian facilities for year-round use.		
A	Provide and enforce snow removal policies, particularly around intersections and bus stops.	Ongoing	Local Governments
B	Implement program to identify and repair broken and substandard sidewalks.	1-5 years	Local Governments
5	Design new streets and retrofit existing streets to reduce speeding.		
A	Ensure that local street standards do not require unnecessarily wide streets.	Ongoing	Local Governments
B	Retrofit existing overly wide streets to reallocate space for other uses as part of reconstruction.	Ongoing	WisDOT, Dane County, Local Governments
C	Incorporate traffic calming features into new local streets where appropriate.	Ongoing	Dane County, Local Governments
D	Implement traffic management programs to address speeding and cut-through traffic problems on existing streets.	Ongoing	Dane County, Local Governments

INTER-REGIONAL TRAVEL

In an increasingly connected world, inter-regional travel must be maintained and expanded. While intercity-bus options are currently available, buses lack a common terminus and often lack good connections to local bus routes. Further, inter-city passenger rail service is unavailable.

Construct an inter-city transit hub. The lack of a centralized inter-city bus terminal is the most immediate need for inter-regional travel by bus. A new facility needs to be centrally located with convenient access to the University of Wisconsin campus as well as downtown Madison. A modern, attractive facility would feature ticket sales and other amenities for passengers. Several of our nearby cities - Milwaukee, Saint Paul, La Crosse, Grand Rapids, and Champaign-Urbana - have terminals that are well located and designed to maximize rider access and comfort.

While a new inter-city bus terminal would initially only serve buses, consideration should be given to future rail service to ensure convenient integration with existing and future services. Inter-city bus operators should be able to reliably access the new terminal without regular interference from traffic and other delays. Further, convenient connections to local transit service should be available.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Build an inter-city bus terminal.		
A	Construct a new high-quality inter-city bus terminal in central Madison.	5-15 years	City of Madison
B	Ensure the new facility has convenient access to downtown Madison and the UW.	5-15 years	City of Madison, UW
C	Ensure that passengers can conveniently transfer to BRT and local buses.	5-15 years	City of Madison, Metro

Support improved inter-city transit. Madison is well-served by inter-city bus service, still, several gaps remain. Demand for travel to the Twin Cities will likely support far more service than is currently provided by the several daily round trips provided by Megabus, Greyhound, and Jefferson. More frequent buses, particularly on the express routes, would make the bus a more attractive alternative to driving. Increased frequency to northeastern Wisconsin is also needed. Only one daily round trip links Madison to Fond du Lac, Oshkosh, Appleton, and Green Bay. The population served by this route would be better served by several daily round trips. Additionally, bus service to Iowa (Dubuque, Davenport, Des Moines, etc.), Omaha, St. Louis, and Kansas City are inconvenient. Improved service could consist of new, longer routes with direct service to these cities, increased frequency, and better connections.

Until passenger rail service is available in Madison, increased access to Amtrak must be provided by increasing the frequency of inter-city service and connectivity to Amtrak stations. Thruway bus service currently provides an extension of Amtrak rail service to Madison. Connections to south and east coast trains in Chicago are convenient with frequent service to Chicago Union Station, but connections to west coast trains like the Empire Builder, California Zephyr, and Southwest Chief may require out-of-direction travel or long waits.

Recommendations and Supporting Actions		Timeframe	Implementing Party
2	Support new and improved inter-city bus service.		
A	Improve service frequency to Minneapolis / St Paul and Appleton / Green Bay.	1-5 years	WisDOT, Private Providers
B	Improve connections to Amtrak services.	1-5 years	WisDOT, Private Providers
C	Provide direct service to Davenport, Des Moines, Omaha, and other cities to the west.	1-5 years	WisDOT, Private Providers

Implement inter-city high-speed passenger rail service. Prior to 2010, an expansion of the popular Amtrak Hiawatha Service was planned to downtown Madison. The service would have had seven trains per day departing Madison, arriving in Chicago with stops in Milwaukee and other cities in between. This project was awarded federal stimulus funds, however, the funds were returned prior to construction.

Planning for inter-city high-speed passenger rail service should not be abandoned. Corridor acquisition and preservation will ensure viability of the service if and when the service becomes politically viable. The project should be as close to "shovel-ready" as possible, with planning efforts finalized and local political support maintained. When rail improvements are needed along previously identified corridors, considerations should be made for the types of improvements that will be compatible with future passenger service.

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	Maintain and preserve the rail network for future passenger rail service.		
A	Identify inter-city passenger rail routes to Milwaukee, Chicago, and Minneapolis / St Paul.	15+ years	WisDOT
B	Identify station locations for passenger rail service.	15+ years	Local Governments, Metro MPO, Dane County, WisDOT

SPECIALIZED TRANSIT

Specialized transit service is coordinated through a variety of services that aim to meet the transportation needs of seniors and disabled individuals. The Dane County Coordinated Public Transit – Human Services Transportation Plan, updated in 2013, provides details on existing services and service and coordination needs. The following highlights some of these needs and recommendations to address them.



Expand the coverage of accessible fixed-route, paratransit, and on-demand taxi services. The expansion of public all-day fixed-route bus service into unserved neighborhoods in peripheral parts of Madison and neighboring communities like Verona, Monona, and Sun Prairie will substantially increase mobility for people with special needs. The new routes utilize accessible buses and automatically increase the paratransit service area. For those without access or the ability to use fixed-route service, paratransit service must continue to expand. Wheelchair accessible taxi service is currently only provided by one taxi company and the cost to provide the service is high, particularly given the intense competitive pressure facing traditional taxi companies with the rapid growth of Uber and other transportation network companies. In order to maintain this service in the future, costs will need to be spread across providers.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Expand the coverage of accessible fixed-route bus and paratransit service and address other identified service related needs.		
A	Implement the recommendations in the Transit Development Plan and address needs identified in the Dane County Coordinated Public Transit - Human Services Transportation Plan	Ongoing	Metro, MPO
B	Explore opportunities to expand paratransit and accessible shared-ride taxi service in urban areas beyond the fixed-route bus service area	5-15 years	Metro, MPO, Dane County
2	Work collaboratively with private taxi operators to ensure accessible taxi service is available and costs for the service are shared equitably.		
A	Work collaboratively with private taxi operators to ensure accessible taxi service is available and costs for the service are shared equitably	Ongoing	MPO, City of Madison, Private Taxi Operators, Non Profits

Continue and expand work-based transportation for low-income workers. Low-income workers will continue to struggle to find reliable ways to get to work and help drive the economy. The YWCA's JobRide program plays a crucial role in filling this niche when public transit options are not available or practical. However, demand for the service exceeds budgetary and physical capacity of the system, and as outlying communities grow, demand will as well.

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	Continue and expand specialized work-based transportation for low-income people.		
A	Work with the non-profit organizations to ensure funding remains available for people to get to work who don't have traditional options.	Ongoing	MPO, City of Madison, non-profit organizations
B	Continue to maximize efficiency by optimizing vehicles and timetables.	Ongoing	Non-profit organizations

Leverage emerging technologies to lower specialized transit operating costs while expanding service availability. Emerging technologies, such as ridesharing services and autonomous vehicles, provide both challenges to existing service delivery methods and opportunities for the future. New technologies that offer proven benefits should be incorporated into the transportation system, and accompanied by supportive policies.

Recommendations and Supporting Actions		Timeframe	Implementing Party
4	Utilize emerging technologies to lower operating costs and expand travel options.		
A	Modify policies as needed to ensure that autonomous vehicles can adequately serve seniors and people with disabilities.	5-15 years	MPO, City of Madison, WisDOT

Continue efforts to better coordinate specialized transit service. The City of Madison and Dane County coordinate successfully, minimizing service duplication. However, with the numerous public and private agencies and programs providing service there are still major coordination needs as documented in the Dane County Coordinated Public Transit – Human Services Transportation Plan. This includes coordinating transit services as well as job training, eligibility requirements, and funding. In addition, local communities should consider transit service availability when sighting senior housing, medical facilities, and other services.

Recommendations and Supporting Actions		Timeframe	Implementing Party
5	Improve interagency coordination of the various specialized transit services and private services.		
A	Plan for the advent of Family Care in Dane County, including for IRIS (self-directed services) members to prevent cost-shifting to Metro Transit.	Ongoing	MPO, City of Madison, Metro Transit
B	Improve coordination of medical trips, including inter- and intra-community trips and from surrounding counties.	Ongoing	City of Madison, WisDOT

TRANSPORTATION DEMAND MANAGEMENT

Maximizing the use of alternative modes and reducing the number of people driving alone can improve air quality, congestion, and the quality of neighborhoods. Transportation Demand Management (TDM) strategies make alternatives to driving more appealing and increase awareness of the available options. TDM programs rely upon a robust transit, bicycle and pedestrian network, and support for ridesharing. Land use decisions and parking strategies also impact the viability of these alternatives.

Expand the regional network of park-and-ride lots to encourage carpooling, transit use, and bicycling. For commuters traveling between communities facilities and services such as park-and-ride lots and vanpools offer options for trips that are not able to be fully served by transit and bicycle infrastructure. Dane County currently has twelve park-and-ride lots but only five offer transit service. Park-and-ride usage could be expanded by increasing the number of lots with that have transit service, preferably limited-stop service, and are located on the bikeway network. To create more park-and-ride lots that serve a variety of transportation modes will require the cooperation of multiple government agencies to ensure the lots are in easily accessible locations and meet the needs of different commuters. Figure 5-12 shows existing and planned park-and-ride lots.

Expand the vanpool program. Currently, the vanpool program primarily serves commuters traveling into downtown Madison and the UW from communities outside of Madison. The State of Wisconsin Vanpool Program is limited by both the destinations it serves and by the hours it travels. In addition, only a limited number of vans are available and all vanpools must include a state employee. Another van service operated by the YWCA called the YW Transit JobRide offers service in the Madison area. The JobRide service provides rides to areas that aren't served by transit and to those that are inaccessible during non-peak transit hours, including nights, weekends, and holidays. The service provides an important complement to the public transit system, but funding it continues to be a challenge and it currently has a waitlist. Expansion of these services will increase options for travel that is hard to serve with transit, bicycling or walking.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Expand the regional network of park-and-ride lots to encourage carpooling, transit use, and bicycling.		
A	Explore partnerships with local communities and agencies to develop park-and-ride facilities.	1-5 years	WisDOT, Dane County, Local governments
2	Expand the state vanpool program and support development of additional vanpool programs.		
A	Support expansion of WisDOA vanpool program and development of additional vanpool programs.	5-15 years	WisDOA, WisDOT, Local Governments, Non-Profits, Private Providers

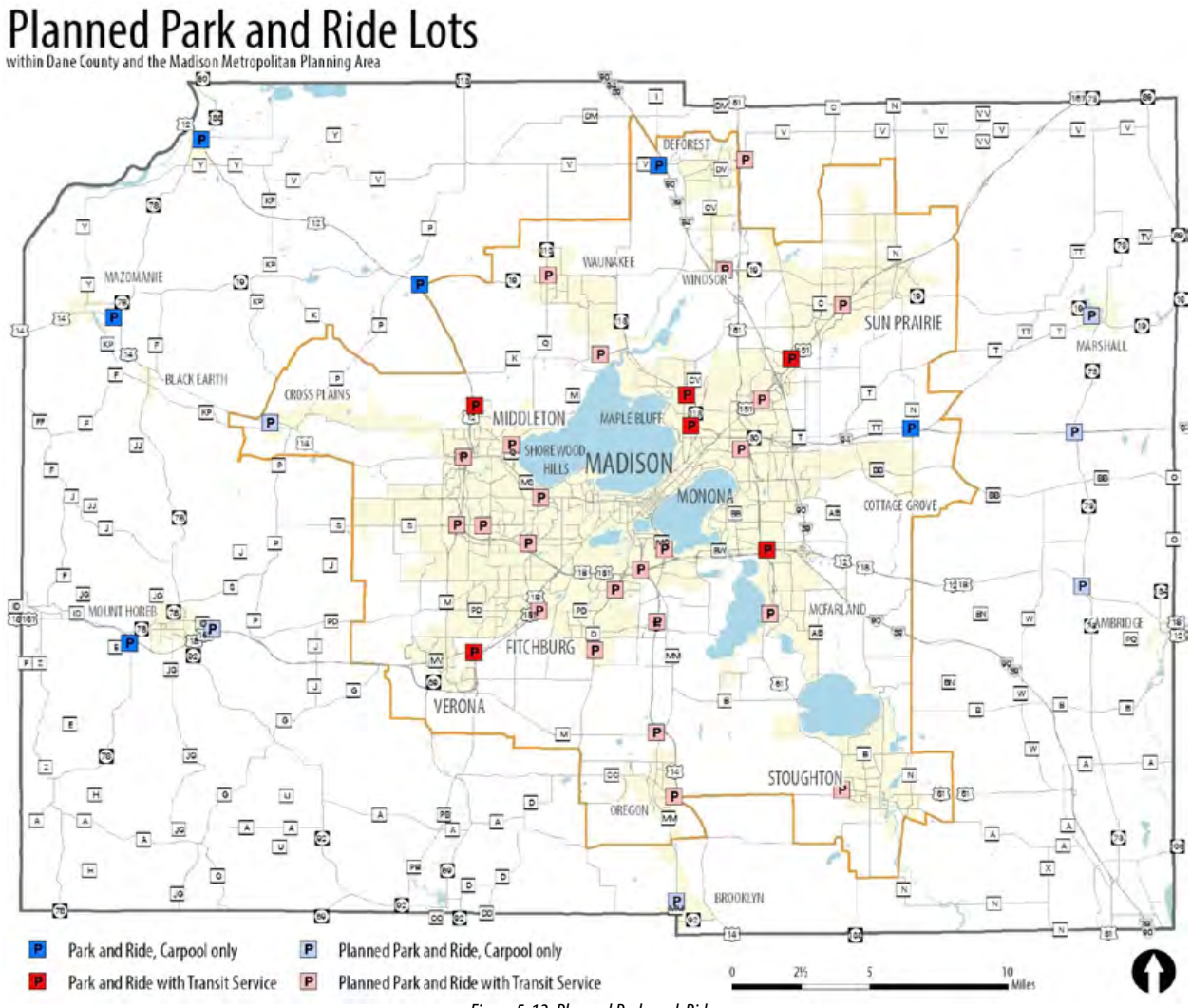


Figure 5-12: Planned Park-and-Rides

Continue to encourage and provide support to large employers, institutions, and municipalities to develop and promote strategies to reduce single-occupant motor vehicle trips. The Madison area has a well-established TDM program, Rideshare Etc., which supports businesses and other institutions to encourage reduced driving. One aspect of the program is the online Rideshare Etc. website, which provides a way for anyone to search online for options, including potential carpool partners. The Rideshare Etc. website is just one resource of the current program, which also includes a Guaranteed Ride Home program and a small marketing program. These current programs form a foundation for the expansion of TDM efforts in the region.



To foster the development of TDM initiatives in the region, local municipalities should develop clear requirements for a TDM plan as a condition of approval for large commercial developments. These requirements should include specific criteria and standards to be met, and provide support for their development and implementation. The establishment of Transportation Management Associations (TMA) in larger employment centers can help businesses meet these requirements. TMAs serve the needs of employers and employees within a business district, industrial park or other area by providing support, promotion, and advocacy for improved transportation policies and opportunities. These efforts will also support strategies such as telecommuting and alternative work schedules that can also help manage congestion.

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	Continue to encourage and provide support to large employers, institutions, and municipalities to develop and promote strategies to reduce single occupant motor vehicle trips.		
A	Support establishment of Transportation Management Associations in major employment centers.	1-5 years	MPO, Local governments
B	Encourage and provide assistance to local communities interested in requiring TDM plans as a condition of approval for large commercial developments, with specific criteria and standards for such plans.	1-5 years	Local governments, MPO
C	Continue to encourage telecommuting and alternative work schedules.	Ongoing	Local governments, MPO

Provide financial incentives for people to use alternative transportation, and increase funding for marketing programs. Financial incentives are among the most effective TDM strategies. The cost and limited availability of parking in the downtown/UW areas is a significant factor in limiting single-occupancy vehicle (SOV) commuting. The advent of unlimited ride pass programs at UW and Madison College have also contributed greatly to increased transit ridership in the past 10+ years. Metro's Commute Card program continues to expand, and a number of businesses track employee commute modes to offer rewards for biking, walking,

taking transit or ridesharing. To continue progress in reducing SOV commuting, it will be important to expand employer participation in Metro's Commute Card program, parking cash-out programs, and other incentive programs. In addition, users of alternative modes will need support programs such as the Guaranteed Ride Home program and occasional parking programs to ease the transition from driving alone. In addition, encouragement programming and marketing efforts will need to be undertaken to ensure that people are aware of their options, especially individualized marketing programs such as a the Love to Ride and Smart Trips programs. These individualized marketing programs are designed to work with people to find solutions that work for their situations and to provide them with the support and resources they need to make incremental changes in their travel behavior.



Recommendations and Supporting Actions		Timeframe	Implementing Party
4	Provide financial incentives for people to use alternative transportation and increase funding for marketing programs.		
A	Continue efforts to expand employer participation in alternative transportation incentive programs such as Metro's Commute Card program, parking cash-out programs, or other financial reward programs.	Ongoing	MPO, Metro, Local Governments
B	Increase funding for support services such as Guaranteed Ride Home, occasional parking programs, and marketing of the programs.	1-5 years	MPO, Dane County, Local Governments
C	Increase funding for advertising and marketing programs, including individualized marketing programs such as Love to Ride and SmartTrips.	1-5 years	MPO, Dane County, WisDOT, Metro

Support transportation options at schools through Safe Routes to School (SRTS) programs. Auto congestion around schools affects traffic flow, air quality, and safety for bicyclists and pedestrians. Safe Routes to School programs encourage more families to walk and bike to school, and work to ensure everyone's safety near schools, particularly in student drop off/pick up areas. SRTS programs also help to increase physical activity in children and support healthy habits for the future. Since the inception of the federal SRTS program many communities in the region have undertaken SRTS projects to improve bicycling

and walking conditions at and around their schools. However, sustainable funding for these efforts is needed to ensure the continued survival and expansion of these programs. Sustainable funding, along with a regional approach to SRTS, will help establish walking and bicycling to school as a safe and efficient way for families to travel to school and help improve students' health.

Recommendations and Supporting Actions		Timeframe	Implementing Party
5	Support transportation options at schools through Safe Routes to School programs.		
A	Secure sustainable funding for a regional Safe Routes to School program, utilizing resources such as mini-grants, CIP funding, local operating budget funding, private funding, and/or federal funding.	1-5 years	MPO, Non-Profits, School Districts, Local Governments
B	Develop and implement a regional Safe Routes to School program.	1-5 years	MPO, Non-Profits, School Districts, Local Governments

TSM, OPERATIONS, AND ITS



Congestion is caused when the demand for a transportation facility approaches or exceeds the capacity of the roadway. The result of a roadway reaching this condition is slower travel speeds, longer trip lengths, and the potential for vehicle queuing when entering or exiting the roadway. Typically, recurring congestion is common during the morning and afternoon rush hour periods on heavily traveled regional roadways. This type of congestion is generally predictable, understood, and accepted by motorists. However, non-recurring congestion caused by construction, crashes, bad weather, and other incidents can lead to unexpected delays and unanticipated travel-time variability. Complicating things, these sources of congestion can trigger secondary events, such as a weather event causing a crash or a special event near a construction zone causing extreme delay. Research has shown that these non-recurring causes contribute to close to half of all congestion. Reliability issues are often more frustrating than congestion, causing commuters to be late for work, buses to run late, and freight to miss delivery windows.

Major capacity expansion projects, such as adding additional lanes, are often not feasible or desirable because of the cost and negative impacts to the environment, residents' quality of life, and other roadway users. However, actively managing the transportation system to improve traffic operations can increase the capacity of a roadway without constructing new lanes. Transportation system management (TSM) includes strategies such as improved traffic signal operations, management of roadway incidents, traveler information, and focused roadway modifications to provide bottleneck relief. Intelligent Transportation Systems (ITS) – sensors, computers, communications systems that allow multiple agencies to work together – can aid these TSM strategies. Even for roadways that will eventually need additional travel lanes, TSM can delay the need for



capacity expansion. After expansion, TSM strategies can help to maximize the value of new capacity. In short, TSM, including ITS, is about maximizing the value of transportation infrastructure.



Update and Implement the Congestion Management Process.
To minimize congestion for all transportation modes and reduce unexpected delay, MATPB has adopted a comprehensive congestion management process (CMP). The CMP prescribes comprehensive transportation system management and operations strategies to ensure the most efficient use of resources and minimum environmental impact. The efficacy of this process is determined in part by an annual performance measurement and monitoring process. The first performance measure report was published in 2016.

In the future, MATPB will refine the CMP to ensure that the process is serving its intended purpose. This includes refining data collection techniques for CMP-recommended performance measures, and ensuring that CMP processes are contemporary compared to that of peer cities. While still legally valid, the process should be updated to reflect changing regional needs, trends, and technologies.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Implement and periodically update the adopted Congestion Management Process.		
A	Continue and improve monitoring of system performance, including post-construction project impact evaluation, utilizing the methodology outlined in the plan.	Ongoing	MPO, Dane County, Local goverments, WisDOT
B	Identify, prioritize, and implement corridor and intersection TSM projects to improve traffic and transit operations and safety on the arterial roadway system.	Ongoing	MPO, WisDOT, Dane County, Local Governments
C	Investigate the feasibility, benefits, and costs of an expanded incident detection and response program for additional state roadways (e.g., Verona Road) and selected local arterials.	1-5 years	WisDOT, Dane County, Local Goverments, MPO
D	Update the CMP to account for new federal rules, data sources, and MPO resources.	1-5 years	MPO

Improve the operation of the transportation network by improving roadway access. Access to and from a roadway is valuable to landowners on adjacent parcels – be it retail establishments, industrial uses, or residential properties. Access points can have a major impact on roadway operations. Land use adjacent to regional roadways should be planned in a way that is consistent with roadway function and geometry. Access should be examined on existing facilities and consolidated, when appropriate.

Recommendations and Supporting Actions		Timeframe	Implementing Party
2	Implement access management plans and standards for existing and planned future arterial roadways as development and street (re)construction occur.		
A	Initiate access management plans on congested corridors as development and street reconstruction occur	1-5 years	MPO
B	Develop a regional access management plan that identifies standards for future arterials roadways, best practices, and safety considerations	1-5 years	MPO

Modernize the transportation network through the use of technologies that improve the operations of existing infrastructure. The operation of the transportation system can be impacted not only by roadway design, but by technologies that modify traffic flow and provide information to influence traveler behavior. In terms of importance, neither method can be understated. To plan for and coordinate future operational improvements, MATPB adopted the first Regional Intelligent Transportation Systems Strategic Plan in early 2016. This plan contains a prioritized list of recommended projects, as well as strategies to guide plan implementation. The plan should be implemented and updated as needed.

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	Modernize the multimodal transportation network using technology.		
A	Include as part of new urban roadway projects infrastructure for connected and autonomous technologies, where appropriate.	Ongoing	WisDOT, Dane County, Local governments
B	Replace obsolete traffic signal controllers with "smart" controllers when replacing traffic signals or constructing new signalized intersections.	Ongoing	WisDOT, Local governments
C	Implement adopted process to identify and integrate ITS infrastructure into planning and design of major state roadway projects.	Ongoing	WisDOT
4	Implement and periodically update the Regional Intelligent Transportation Systems Strategic Plan.		
A	Continue planning efforts to advance the recommendations listed in the ITS plan .	Ongoing	WisDOT, Dane County, Metro, Local governments
B	Continue to engage with the ITS Plan Implementation Subcommittee to facilitate cooperation and coordination among state and local agencies.	Ongoing	MPO
C	Continue efforts to provide comprehensive real-time traveler information to people and businesses.	Ongoing	WisDOT, City of Madison
D	Implement a smart card payment system that can be expanded to include a common fare media for other civic uses, as well as an open payment system that accepts fares using personal electronic devices.	1-5 years	Metro

FREIGHT, AIR, AND RAIL

Freight, air, and rail access improve the financial condition of area residents and businesses alike. Policies related to these modes should be designed to enhance the financial interests of all in the region.

Increase the local focus on freight planning. Freight interests should be incorporated into local planning efforts to ensure promotion and preservation of freight uses along freight corridors and targeted expansion of freight-related infrastructure.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Maintain and promote new industrial uses along freight corridors.		
A	Work with stakeholders to determine significant transportation issues that negatively impact freight focused businesses within the region.	1-5 years	MPO, WisDOT
B	Work to cluster similar industrial uses to promote efficiency of the freight network.	Ongoing	Local governments
2	Maintain and expand infrastructure on the multimodal freight network, prioritizing projects that improve safety and efficiency, and minimize lifetime costs.		
A	Investigate and implement vehicle-to-infrastructure technologies to increase safety along freight corridors.	1-5 years	WisDOT, Dane County, Local governments
B	Investigate and implement vehicle-to-infrastructure technologies that reduce delay for passenger and freight vehicles in freight corridors.	1-5 years	WisDOT, Dane County, Local governments
C	Investigate ways in which new technologies, such as 3D printing, may impact the demand for future transportation facilities when planning improvements to the network.	1-5 years	WisDOT, Dane County, Local governments
D	Continue enforcement of truck weight regulations to reduce premature deterioration of roadways and bridges.	Ongoing	WisDOT
3	Increase focus on freight planning for regional and local transportation facilities.		
A	Continue to incorporate freight considerations into corridor and planning studies.	Ongoing	WisDOT, Dane County, Local governments
B	Plan for and implement recommendations from the Wisconsin State Freight Plan.	Ongoing	WisDOT, Local governments
C	Ensure local and regional freight-centric projects are listed in Wisconsin State Freight Plan to maintain eligibility for enhanced federal matching funds.	1-5 years	WisDOT, Dane County, MPO, Local governments
D	Consider first and last mile(s) implications for freight when approving site plans for freight focused facilities.	Ongoing	Local governments

Mitigate rail conflicts while maintaining the viability of rail service. Safety concerns at rail crossings should be studied and remedied with the help of private rail operators. Land use conflicts, such as rail crossings in residential areas, should be mitigated through the use of improvements that allow designation of "quiet zones." Rail corridors should be acquired when abandoned to preserve the corridors for future freight and passenger rail service, and other transportation uses. Further, governmental agencies should work with private operators to accommodate heavier loads at higher speeds.

Recommendations and Supporting Actions		Timeframe	Implementing Party
4	Maintain the availability of rail facilities for current and future uses.		
A	Preserve rail corridors for freight uses, acquiring excess land when available to ensure availability for future transportation uses.	Ongoing	WisDOT, Rail Transit Commissions
B	Replace ties, ballast, and jointed rail with modern materials to accommodate heavier loads and higher speeds.	Ongoing	WisDOT, Rail Transit Commissions, Private Operators
C	Plan for improvements to accommodate high speed, high volume passenger service on routes to Milwaukee, Chicago, and St Paul, such as positive train control, double-tracking, and electrification.	15+ years	WisDOT
5	Mitigate conflicts between rail and other uses		
A	Identify high-conflict rail crossings and mitigate conflicts, when possible.	Ongoing	WisDOT, Dane County, Local Governments
B	Continue to implement quite zones in residential neighborhoods within urbanized areas.	Ongoing	Local Governments
C	Work with rail companies to grade-separate high-use rail crossings.	Ongoing	WisDOT, Dane County, Local Governments

Ensure compatibility of land use planning near airports. The area in which an airport operates is often subject to a number of negative externalities such as increased noise, light, and air pollution. Care should be taken to ensure compatibility of land uses by accounting for existing and future airport master plans in development of local comprehensive plans. Further, the airport master plan should account for future land use plans encapsulated in local comprehensive plans.

Recommendations and Supporting Actions		Timeframe	Implementing Party
6	Ensure compatibility of uses near airports.		
A	Ensure land use plans within airport influence areas are compatible with existing and planned airport plans.	Ongoing	Local Governments
B	Ensure Airport Master Plans consider existing and future uses identified in community comprehensive plans.	Ongoing	Dane County
C	Continue to implement the Airport Master Plan.	Ongoing	Dane County
7	Improve airport facilities to enhance usability and convenience for passenger traffic.		
A	Improve connections to the airport for all modes of transportation, including increasing frequency and speed of transit connections between Dane County Airport, downtown Madison, and the UW campus.	Ongoing	WisDOT, Dane County, Metro, Local Governments
B	Consider how future transportation technologies may influence the way that passengers travel to and from airports when building new parking lots and passenger pickup/drop off facilities.	1-5 years	MPO, Dane County, Local governments

Improve airport accessibility for passenger flights and freight. Accessibility to Dane County Regional airport should be improved by all modes, specifically transit. Consideration of future technologies, such as autonomous vehicles, should be made before embarking on major parking enhancement projects. Freight-related facility accessibility should be improved as needed for local businesses.



Recommendations and Supporting Actions		Timeframe	Implementing Party
8	Improve airport facilities freight accommodations and connections		
A	Survey businesses to determine if Dane County Airport is adequately serving their needs and determine what could be done to improve service.	1-5 years	Dane County
B	Contact freight shippers operating out of Dane County Airport to determine if needs are being met with current facilities and identify improvements that must be made for future success.	1-5 years	MPO, Dane County, Local governments
C	Survey local businesses to determine if air freight needs are being met and what types of improvements would improve business viability.	1-5 years	MPO, Dane County, Local governments

PARKING

Adequate parking is necessary for the vibrancy and vitality of urban areas. It fosters economic activity in retail shopping and entertainment districts and ensures the success of business and office areas. However, over-constructing parking can lessen these advantages while discouraging users to rideshare, take transit, walk, or bike to their destinations. This modal diversion can lead to increases in congestion in already congested parts of the region. Further, emerging technologies may impact the need for parking facilities.

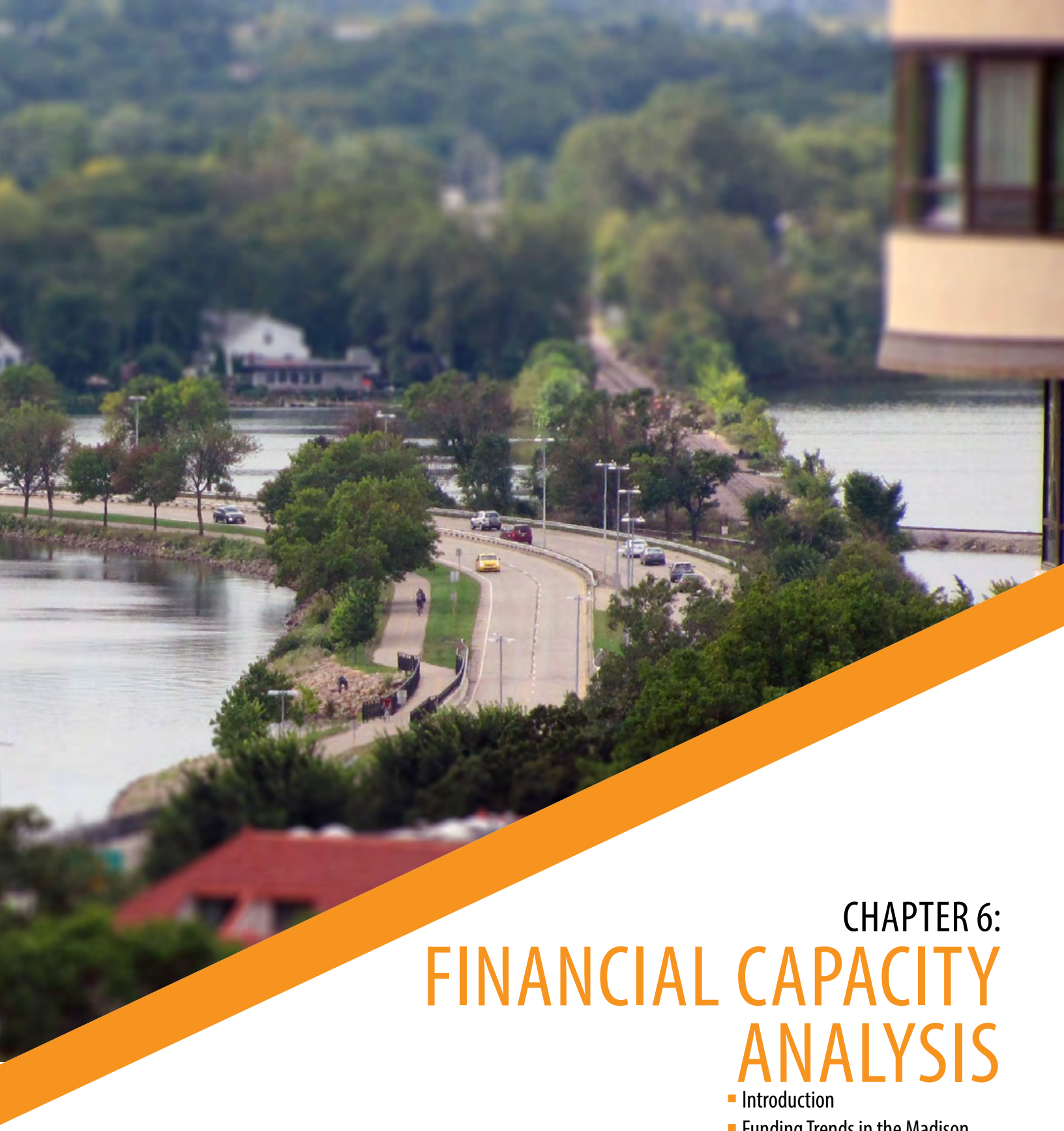
Use parking management strategies to reduce congestion and encourage multi-modalism. Strategically managing parking availability will ensure vibrancy of areas while encouraging multi-modalism. Such strategies may include demand-responsive pricing, where parking fees are higher when parking is most in demand. Local governments should also consider revising parking requirements to allow developers to determine the need for parking based on market demand, while avoiding shortages that may result in parking spillover in surrounding areas. Parking requirements and policies that reduce excessive parking are particularly important in downtowns and other mixed-use activity centers. In a recent update to its zoning code, the City of Madison removed nearly all parking minimums in non-residential districts, and for some residential areas only requires site plans showing where parking could be provided if needed in the future. Parking minimums had not been applied in the downtown for quite some time.

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Use parking management strategies to reduce congestion within downtown areas and major activity centers.		
A	Develop and implement a downtown Madison parking management plan.	1-5 years	City of Madison
B	Implement technologies and associated policies, such as demand responsive pricing, that increase access and convenience to parking, and reduce vehicle idling and circling to find parking.	5-15 years	Local governments
C	Encourage ridesharing by developing and implementing policies that reduce parking rates and/or provide preferential parking spots to carpools and vanpools.	1-5 years	Local governments
2	Modify parking requirements to encourage multi-modalism, using a more market-based approach while addressing potential spillover impacts.		
A	Review minimum parking requirements to ensure an appropriate balance between parking needs and continuity of the built environment.	1-5 years	Local governments
B	Allow deviation from parking minimums, particularly in dense urban areas, to accommodate innovative project designs that maximize access to alternative modes of transportation and incorporate TDM strategies.	1-5 years	Local governments

Ensure the flexibility of existing and future parking facilities to accommodate future technologies. Emerging technologies, such as ridesharing and autonomous vehicles, have the potential to reduce and/or change the demand of parking facilities. New facilities should be constructed in a way that allows their conversion to other uses, and existing facilities should be evaluated for other uses when reaching the end of their viability.



Recommendations and Supporting Actions		Timeframe	Implementing Party
3	Ensure flexibility of parking facilities to accommodate future technologies.		
A	Ensure that streets are designed with future flexibility in mind and that parking policies allow for conversion to loading zones if/when autonomous vehicle technologies are implemented.	1-5 years	Local governments
B	Ensure new parking structures are designed to allow for conversion to other uses if/when autonomous vehicle technologies are implemented.	5-15 years	Local governments



CHAPTER 6: FINANCIAL CAPACITY ANALYSIS

- Introduction
- Funding Trends in the Madison Metro Area
- Projected Revenues Through 2050
- Projected Expenses Through 2050
- Conclusion

INTRODUCTION

Federal transportation planning rules require that regional transportation plans include a financial capacity analysis to demonstrate that the plan is fiscally constrained. That is, it must be demonstrated that the estimated costs of recommended projects in the fiscally constrained plan and maintenance of the existing transportation system can be covered using available and projected revenue sources. If projected funding shortfalls exist, new sources of revenue must be identified. In other words, the plan cannot simply be a wish list of projects. This requires prioritizing potential projects, realistically assessing the ability of transportation providers in the metropolitan area to fund particular projects, and balancing the needs of new facilities or capacity expansion projects with system preservation needs.

The plan can identify recommended or needed projects, but if it cannot be demonstrated that funding is reasonably likely to be available for the projects, they cannot be included in the federally recognized plan. Examples of projects and services identified as needed but not included in the fiscally constrained plan are the Bus Rapid Transit (BRT) system and some of the other transit service improvements, and construction of the North Mendota Parkway between CTH M and US 12. While the BRT system is not included in the fiscally constrained plan, planning is underway to identify and design the first segment. The City of Madison (Metro Transit) will then apply for federal Small Starts funding for the project. The City of Madison has included funding for the project in its multi-year capital budget. It is anticipated that the project will be amended into the plan once an initial route and station locations have been identified.

The financial capacity analysis takes into account recent trends in sources and uses of funds, and estimates the ability of existing funding sources to meet the maintenance, preservation, and capacity expansion needs of the transportation system. Estimated project costs and funding must be in year-of-expenditure dollars, reflecting an assumed inflationary factor. An inflationary factor of 2.0% for both project costs and program funding has been assumed in accordance with WisDOT and FHWA guidance.

The current federal surface transportation legislation, the Fixing America's Surface Transportation (FAST) Act, passed in December 2015, provides the federal transportation funding program and planning framework for the next few years. The legislation provides for about a 2% annual increase in funding through 2020. While there have been some relatively minor



changes in programs, the current basic framework has been in place since 1991 when the landmark ISTEA legislation was passed. Therefore, it is safe to assume that this basic framework and recent funding levels will continue. While some short-term funding methods were employed to provide the necessary funding for the FAST Act, it is expected that a long-term solution will be developed to maintain funding levels. Any changes in programs or funding levels provided in the next reauthorization legislation will be incorporated into an updated financial analysis as part of the next major plan update in five years.

The financial capacity analysis assumes that state funding will also increase around 2% annually. Unlike the case with federal funding, this has not been the recent trend. According to a recent WisDOT report (see below), since 2006 the state motor vehicle fuel tax rate has remained the same and annual revenue from the tax has grown only 7.2% - a compound annual growth rate of 0.6%. Adjusted for inflation, gas tax revenue has actually declined during this period. As a result, WisDOT has in recent years relied on transfers from the General Fund and Petroleum Inspection Fund, along with increased bonding. This plan assumes that in the long term, the state transportation fund situation will be addressed and that inflationary increases to recent spending levels in the Madison metro area will be provided.

State Transportation Fund Solvency Report – A Solvency Study from the Wisconsin Department of Transportation (Dec. 2016)

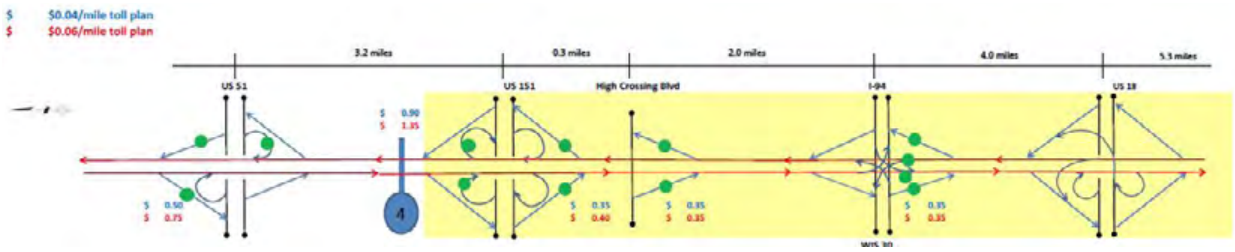
The 2015-17 biennial budget required WisDOT to conduct a study of the solvency of the state transportation fund. The study relied in part on a 2013 study by the Wisconsin Commission on Transportation Finance & Policy that examined and made recommendations regarding new revenue sources. The 2016 study analysis included five main components:

- Results from a related study focused on recent efficiency improvements at WisDOT;
- Description of current revenue sources for transportation;
- Description of current transportation expenditures by program area;
- Analysis of scenarios for future expenditures compared to projected revenues; and
- Potential options for new revenue, including a detailed feasibility study of tolling the Interstate highways in the state.



Tolling was not fully evaluated in the 2013 study, so the latest study included an examination of the feasibility of tolling on the Interstate highways in the state. This feasibility study evaluated current and best practices from tolling in other states, legal and policy issues that would need to be addressed, and revenue and traffic forecasting for tolling (including an estimate of infrastructure and operating costs and potential traffic diversion from tolled routes).

The fund solvency study projected revenues over the next 10-year period and then examined three different expenditure scenarios, and their impacts on the resulting condition of the transportation system. In terms of revenues, motor vehicle fuel



Tolling example for the I-39/90/94 corridor through the metropolitan planning area. Source: WisDOT Solvency Report, Appendix B.

taxes are expected to decrease due to greater vehicle fuel efficiency while vehicle registration fees are expected to grow a small amount. The three expenditure scenarios for 2018-2027 were: (1) spending less than the current 2015-17 budget; (2) spending at same level as current budget; and (3) a modest increase in spending above the current budget levels. A funding shortfall was projected for all scenarios – from $852 million over the decade in one to $7.94 billion in three.





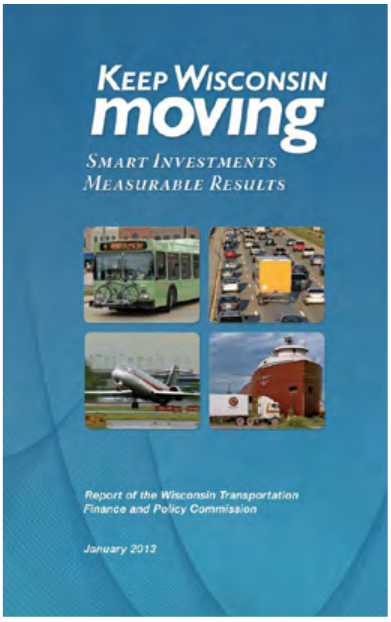
Under scenario one, the number of state highway system miles rated in poor or worse condition would increase 109% from 21% to 44% by Fiscal Year (FY) 2027. The second phase of the Verona Road (US 18/151) project, which involves expansion of Verona Road south to CTH PD and new interchanges at Williamsburg Way and CTH PD, would be delayed a year to 2019-2021 and the Interstate 39/90 (Madison Beltline to Ill. State Line) expansion project delayed three years with the Beltline/Interstate interchange project funded in FYs 2025-27 following completion of the Interstate expansion project. No new Majors program projects, such as the Beltline and Stoughton Road/US 51 currently being studied, could be enumerated (approved for funding) by the state Transportation Projects Commission until FY 2026-30. Other estimated impacts include a cumulative loss in purchasing power (given inflationary cost increases) of $798 million in local General Transportation Aids (GTA) – the largest source of state funding for local roadways – and a cumulative funding gap in Metro Transit operating assistance of $25 million.

Under scenario two, the number of state highway system miles rated in poor or worse condition would increase 93% while the number rated at fair or better would decrease by 25%. The Verona Road and Interstate expansion projects would not be delayed. New Majors program projects could be approved in 2020 (the list includes Stoughton Road/US 51 and US 51, McFarland to Stoughton) and 2026 (Beltline). GTA and Metro Transit impacts would be the same as in scenario one.

Under scenario three, the number of state highway system miles rated in poor or worse condition would increase 72% while the number rated at fair or better would decrease by 19%. The Verona Road project could be constructed a year ahead of schedule (2017-2019). The Interstate/Beltline interchange project could be funded in FY 2021-2023 at the completion of the Interstate expansion project. Enumeration of the Stoughton Road/US 51 and US 51, McFarland to Stoughton projects would still occur in 2020, but the Beltline project could be enumerated in FY 2022. GTA impacts are assumed to remain the same, while the scenario assumes approval of enabling legislation for local transit authorities, the increased revenue from which could offset the loss of state transit operating funding and address unmet capital needs. For Metro Transit, these capital needs include a planned new satellite bus garage/maintenance facility that is needed to accommodate a larger bus fleet required to expand weekday peak period service, add larger, articulated buses, and ease severe over-crowding at the current facility.

The fund solvency study considered potential additional revenue sources and estimated their potential revenue. These include increases to current fuel-based taxes and vehicle registration and license fees and three completely revenue sources: registration fee based on number of miles a vehicle is driven; new highway use fee of 2.5% on the price of new vehicle registered in state for the first time; and tolling on the Interstate system. Federal restrictions would likely limit the use of tolling revenue to investments in the facility or the broader interstate highway from which it was collected.

The study did not make any recommendations about transportation revenue and expenditure options, including tolling. The report simply provided the scenarios and potential revenue options for consideration. In 2013, the Wisconsin Commission on Transportation Finance and Policy, which was created in the 2011-2013 biennial state budget and charged with examining issues related to the future of transportation finance in Wisconsin, recommended strategies for additional funding.



The Commission issued a report, Keep Wisconsin Moving – Smart Investments, Measurable Results, which recommended additional annual funding of around $480 million over the following ten years for all modes of transportation. That level of investment was determined to be needed to maintain existing road and bridge conditions, make safety improvements, provide limited major highway modernization, and provide some other multi-modal facility and service improvements. In order to provide the additional revenue, the Commission recommended the following:

- Raise the state gas tax by 5 cents, to 23 cents per gallon;
- Adopt a new mileage-based registration fee for cars and light trucks that would amount to one cent for each mile traveled;
- Increase the annual registration fees for commercial vehicles by 73 percent;
- Increase the fee for an 8-year drivers license by $20; and
- Eliminate the sales tax exemption on the trade-in value of a vehicle.

The Commission also recommended the following:

- Enactment of legislation to allow for regional or local transportation or transit authorities supported by county or local sales taxes;
- Increase bonding while keeping debt service payments at a manageable level;
- Indexing the state fuel tax and vehicle registration fees to the inflation rate as had been the case for many years;
- Support federal legislation to allow states more flexibility to enact tolls on the Interstate system and other highways designated as part of the National Highway System; and
- Support a state constitutional amendment to protect the state transportation fund - passed in a November 2014 ballot measure.

FUNDING TRENDS IN THE MADISON METRO AREA

County and Municipal Streets/Roadways

Municipal streets are mostly financed by local funding sources. These include general revenues and bonds and, in the case of municipalities, also special assessments, impact fees, and tax increment financing. Counties cost share with municipalities on some projects. WisDOT distributes state funding to counties and municipalities through the state's General Transportation Aids and Connecting Highway Aids programs, and through other local programs such as the Local Road Improvement Program.

Figure 6-1, Historical County and Local Street/Roadway Expenses, shows the expenditures for operations and maintenance, construction, and other street related facilities (e.g., lighting, sidewalks, storm sewers) by municipalities in the Madison

Figure 6-1

Historical County and Municipal Street/Roadway Expenses ($000's)

within the Madison Metropolitan Planning Area

	2010				2011				2012				2013				2014			
County/ Municipality	**O & M [1]**	**Const. [2]**	**Other [3]**	**Total**	**O & M [1]**	**Const. [2]**	**Other [3]**	**Total**	**O & M [1]**	**Const. [2]**	**Other [3]**	**Total**	**O & M [1]**	**Const. [2]**	**Other [3]**	**Total**	**O & M [1]**	**Const. [2]**	**Other [3]**	**Total**
Dane County [4]	6,955.8	3,053.5	363.4	10,372.7	7,762.8	1,684.0	1,025.6	10,472.4	8,096.3	7,610.1	717.3	16,423.7	7,800.9	6,794.7	452.4	15,048.0	7,824.2	4,906.5	381.8	13,112.5
C. Fitchburg	1,541.6	2,803.9	159.6	4,505.1	1,552.8	3,416.9	140.2	5,109.9	1,543.3	16,629.9	134.6	18,307.8	3,416.2	2,020.5	133.3	5,570.0	1,870.3	8,287.8	182.6	10,340.7
C. Madison	24,201.6	17,177.5	4,687.9	46,067.0	18,597.8	25,050.9	7,272.9	50,921.6	17,767.1	26,463.0	5,793.1	50,023.2	19,519.6	17,360.1	6,371.6	43,251.3	20,900.8	18,097.0	10,235.7	49,233.4
C. Middleton	2,015.5	1,899.5	271.6	4,186.6	2,118.7	1,129.1	322.7	3,570.5	1,862.0	1,064.2	463.5	3,389.7	2,406.0	2,682.9	370.8	5,459.7	2,186.0	1,136.4	8,602.3	11,924.7
C. Monona	710.6	2,751.6	71.2	3,533.4	763.4	3,599.2	95.3	4,457.9	749.0	3,100.2	116.8	3,966.0	736.3	3,135.2	105.1	3,976.7	890.7	615.4	161.9	1,668.0
C. Stoughton	1,336.4	317.6	1,322.7	2,976.7	1,365.0	914.4	928.4	3,207.8	1,246.0	577.9	762.6	2,586.5	1,132.8	486.8	202.7	1,822.4	1,202.8	2193.9	287.9	3,684.6
C. Sun Prairie	3,083.3	2,199.0	651.8	5,934.1	2,783.0	2,400.3	662.5	5,845.8	2,688.1	1,518.7	445.4	4,652.2	3,163.5	2,221.7	390.9	5,776.1	2,985.0	3,118.6	973.1	7,076.6
C. Verona	914.0	1,180.1	183.5	2,277.6	1,284.3	1,057.0	208.0	2,549.3	1,532.9	1,138.3	721.5	3,392.7	1,111.8	2,362.9	203.8	3,678.4	1,047.8	1,608.6	222.2	2,878.6
Cities Total	**33,803.0**	**28,329.2**	**7,348.3**	**69,480.5**	**28,465.0**	**37,567.8**	**9,630.0**	**75,662.8**	**27,388.4**	**50,492.2**	**8,437.5**	**86,318.1**	**31,486.3**	**30,270.1**	**7,778.2**	**69,534.5**	**31,083.3**	**35,057.7**	**20,665.7**	**86,806.7**
V. Cottage Grove	572.1	406.4	120.3	1,098.8	447.2	337.8	94.6	879.6	522.7	1,173.7	93.1	1,789.5	718.4	359.2	148.2	1,225.8	1,291.1	2.3	93.6	1,386.9
V. Cross Plains	392.0	220.7	69.7	682.4	344.2	314.5	71.4	730.1	341.0	175.6	73.4	590.0	429.8	891.3	76.6	1,397.7	419.8	1,631.8	76.1	2,127.6
V. DeForest	424.6	857.7	372.2	1,654.5	530.7	888.2	155.4	1,574.3	413.8	2,344.5	259.6	3,017.9	457.9	2,226.4	216.6	2,900.9	466.8	1,235.4	371.2	2,073.4
V. Maple Bluff	105.7	2,956.9	427.9	3,490.5	133.3	62.4	62.4	258.1	248.7	71.7	52.2	372.6	237.4	216.2	34.9	488.6	223.4	3,840.5	51.3	4,115.2
V. McFarland	1,113.8	21.7	95.5	1,231.0	1,050.1	-	119.4	1,169.5	984.8	-	104.9	1,089.7	912.4	239.3	109.7	1,261.5	967.2	212.3	97.5	1,277.0
V. Oregon	812.8	520.7	384.0	1,717.5	906.2	93.5	206.9	1,206.6	458.5	125.5	222.7	806.7	707.1	199.6	171.0	1,077.7	706.1	449.4	158.7	1,314.2
V. Shorewood Hills	275.5	1,011.2	25.2	1,311.9	201.2	1,233.7	23.5	1,458.4	273.0	1,061.2	26.9	1,361.1	218.8	1,163.3	30.9	1,413.0	334.5	619.9	176.1	1,130.5
V. Waunakee	1,764.7	2,420.1	291.8	4,476.6	1,275.6	1,659.8	472.0	3,407.4	977.5	1,471.0	366.5	2,815.0	967.0	2,230.9	317.6	3,515.5	1,253.5	1,824.8	943.5	4,021.8
V. Windsor 5	257.2	131.4	27.6	416.3	287.5	84.8	28.5	400.8	265.6	203.7	27.8	497.0	285.3	212.7	28.6	526.6	302.2	211.2	32.4	545.8
Villages Total	**5,718.4**	**8,546.8**	**1,814.2**	**16,079.5**	**5,176.0**	**4,674.7**	**1,234.1**	**11,084.8**	**4,485.6**	**6,626.9**	**1,227.1**	**12,339.5**	**4,934.0**	**7,739.1**	**1,134.2**	**13,807.2**	**5,964.5**	**10,027.6**	**2,000.5**	**17,992.5**
T. Berry [6]	38.1	65.6	0.0	103.8	51.4	89.1	0.0	140.6	65.6	35.4	0.0	101.0	56.4	20.8	0.1	77.3	50.2	30.6	0.1	80.8
T. Blooming Grove	232.4	93.7	16.2	342.3	111.2	152.7	19.9	283.8	190.4	204.1	17.3	411.8	150.6	140.6	24.8	316.0	164.8	203.9	24.5	393.3
T. Bristol [7]	259.5	29.3	8.3	297.1	387.1	2.1	9.1	398.3	280.1	-	9.9	290.1	420.9	-	8.4	429.3	244.6	-	10.0	254.6
T. Burke	303.1	24.9	13.7	341.7	229.2	366.9	8.5	604.6	256.1	467.4	9.0	732.5	257.3	202.4	9.7	469.4	251.3	483.1	10.2	744.6
T. Cottage Grove [8]	430.5	129.7	-	560.2	377.7	134.6	-	512.3	371.5	218.7	-	590.2	388.1	255.0	1.4	644.6	353.9	341.4	1.3	696.7
T. Cross Plains [9]	61.7	54.1	0.4	116.2	60.3	1.3	0.5	62.1	54.0	1.3	0.5	55.9	71.2	-	0.5	71.7	83.8	-	0.5	84.4
T. Dunkirk [10]	261.9	-	4.2	266.2	336.6	-	7.2	343.7	195.6	82.2	18.0	295.8	229.1	101.2	4.7	335.0	287.1	43.5	5.0	335.6
T. Dunn	411.6	151.8	11.5	574.9	405.8	117.7	11.8	535.3	447.6	177.6	12.0	637.2	584.4	168.7	12.6	765.7	481.5	299.4	12.6	793.4
T. Madison	333.6	852.9	30.1	1,216.6	347.3	874.7	35.6	1,257.6	369.2	132.8	33.0	535.0	348.1	0.8	36.2	385.1	689.5	85.3	34.4	809.3
T. Middleton	404.4	809.9	235.0	1,449.3	447.3	1,573.2	70.0	2,090.5	446.9	429.6	199.3	1,075.8	539.9	381.1	63.5	984.5	1,147.2	514.0	126.7	1,787.9
T. Oregon [11]	110.3	107.3	-	217.5	184.7	100.5	-	285.2	95.9	113.2	-	209.1	144.2	141.6	-	285.8	166.2	94.6	-	260.8
T. Pleasant Springs [12]	258.8	-	0.5	259.3	359.5	-	0.5	360.0	302.5	-	0.5	303.1	332.6	-	0.6	333.2	400.3	-	0.6	400.9
T. Rutland [13]	68.9	28.1	1.5	98.4	76.8	78.6	0.9	156.3	68.2	86.9	0.8	155.9	96.8	134.6	0.9	232.2	78.9	81.8	1.5	162.1
T. Springfield [14]	201.4	2.3	1.0	204.6	237.4	2.3	1.1	240.7	378.6	1.7	1.2	381.5	245.2	1.2	1.3	247.7	301.3	1.5	1.3	304.0
T. Sun Prairie [15]	181.8	-	-	181.8	652.7	-	-	652.7	298.0	-	-	298.0	227.7	-	-	227.7	217.5	-	-	217.5
T. Verona [16]	284.1	116.8	2.3	403.3	217.9	254.4	2.4	474.7	231.8	181.2	2.4	415.5	414.2	51.7	2.2	468.1	244.6	428.6	2.5	675.7
T. Vienna [17]	244.9	46.6	1.7	293.1	206.2	106.7	1.8	314.6	157.0	131.8	1.5	290.3	213.8	93.3	1.4	308.5	231.8	240.7	1.6	474.2
T. Westport	1,040.9	-	3.2	1,044.1	940.7	-	3.4	944.1	461.2	-	3.4	464.6	561.8	-	3.9	565.7	1,299.9	-	4.1	1,303.9
Towns Total	5,127.8	2,512.9	329.8	7,970.5	5,629.7	3,854.8	172.7	9,657.2	4,670.4	2,264.0	308.9	7,243.3	5,282.4	1,692.9	0,172.1	7,147.5	6,694.5	2,848.4	0,236.8	9,779.7
MPO PL Area Total	**51,605.1**	**42,442.4**	**9,855.7**	**103,903.2**	**47,033.5**	**47,781.3**	**12,062.3**	**106,877.2**	**44,640.7**	**66,993.3**	**10,690.8**	**122,324.7**	**49,503.5**	**46,496.8**	**9,536.9**	**105,537.2**	**51,566.4**	**52,840.2**	**23,284.7**	**127,691.4**

[1] Roadway operations and maintenance costs, including costs for engineering, highway equipment, and buildings. For county, includes depreciation for equipment and buildings.

[2] Includes operating expenditures and capital costs for constructing roadways.

[3] Includes operating expenditures and capital costs for road related facilities costs, including limited purpose roads, street lighting, sidewalks, storm sewers, and parking facilities.

[4] Estimated at 89.19%.
[5] Estimated at 76.49%.
[6] Estimated at 24.93%.
[7] Estimated at 72.35%.
[8] Estimated at 81.88%.
[9] Estimated at 30.86%.
[10] Estimated at 65.09%.
[11] Estimated at 45.16%.
[12] Estimated at 65.12%.
[13] Estimated at 36.22%.
[14] Estimated at 50.48%.
[15] Estimated at 66.90%.
[16] Estimated at 80.75%.
[17] Estimated at 67.68%.

Note: Costs rounded to nearest $1,000. "-" indicates zero or no data available, while 0.0 indicates less than $500.

Source: Wisconsin Dept. of Revenue, County and Municipal Revenues and Expenditures Reports.

Metropolitan Planning Area from 2010 to 2014, the last year for which data was available. The expenses include those from local revenues as well as state and federal programs. The source of the information are the *County and Municipal Revenues and Expenditures by Wisconsin Cities, Villages & Towns* reports published by the Wisconsin Department of Revenue. Total annual costs for Dane County and all municipalities within the Madison Metropolitan Area during this 5-year period ranged from $103.9 million in 2010 to $127.7 million in 2014 with an annual average of $113.3 million.



Federal and State Funding for Streets/Roadways

Federal and state funding accounted for 24% and 56% of revenues, respectively, in the WisDOT 2015-17 biennial budget with bond funds (13%) and other funds (7%) accounting for the remainder.



Federal funding is derived from the federal motor fuel tax and then allocated to the states and large urban areas. Federal program funding sources under the current surface transportation legislation, the FAST Act, that are used for roadway improvements include the following:

- National Highway Performance Program (NHPP);
- Surface Transportation Program Block Grant (STBG) Program (formerly Surface Transportation Program), which includes several categories of funding (Urban, Rural/Small Urban, State Flexibility, and Bridge Replacement and Rehabilitation); and
- Highway Safety Improvement Program (HSIP) (includes three categories).



The NHPP and STBG – State Flexibility programs have been used exclusively for state highway projects, while the HSIP and STBG – Bridge programs are available for funding both state and local projects. The STBG – Urban and Rural/Small Urban programs are for county and local roadway projects. For the Madison Metropolitan Area, the STBG Urban Program is the most significant of these federal programs. Most of the funding has been used for county and local road projects, but the program has also been used for other capital projects such Metro Transit bus purchases and a programmed ITS project. MATPB receives an allocation of STBG Urban Program funding and selects county and local projects for funding based on approved policies and project evaluation criteria. MATPB's allocation for 2016-2020 is an average of $6.86 million per year. Based on the FAST Act, the current federal transportation bill, funding for the upcoming 2018-2022 program cycle is expected to increase to an annual average of $7.07 million. This funding level is assumed to continue with inflationary adjustments as with other programs.



State transportation funding is derived primarily from the state motor fuel tax, driver license fees, and vehicle registration fees. Funding for state

highways is distributed through several programs, including the following:

- State Highway Rehabilitation (SHR) program, which funds maintenance work on existing state highways along with safety and minor capacity improvements;
- Highway System Management and Operations (HSMO) program, which funds activities to ensure the proper functioning and safety of the state highway system, including traffic operations and management of the State Traffic Operations Center; and
- Majors program, which funds the most complex and costly projects, often involving capacity expansion, to address the most serious deficiencies on the most important state highways.

Figure 6-2

Annual Roadway Revenue Estimates ($000's)

for the Madison Metropolitan Planning Area

Roadway Construction	Funding Program	Avg. Annual Funding ($000s)
State Highways		
Federal/State Funding	Combined Backbone and non-Backbone and Majors	$ 69,876
Local Roadways		
Federal/State Funding	STBG, Local Roads Improvement Program (LRIP), Federal Safety Programs, Local Bridges, 70% General Transportation Aids , 70% Connecting Highway Aids	$ 24,035
Local Funding	Total County/Local Revenue (from State Department of Revenue) less Federal/State Funding Estimate	$ 45,001
Subtotal of Local Roadways		***$69,035***
Subtotal		**$ 138,912**
Roadway Maintenance and Operations	**Funding Program**	**Avg. Annual Funding ($000s)**
State Highways		
Federal/State Funding	State Highway Maintenance and Operations, State Highway Rehabilitation (SHR) Bridges, SHR Large Bridges	$ 7,964
Local Roadways		
Federal/State Funding	30% General Transportation Aids, 30% Connecting Highway Aids	$ 6,012
Local Funding	Total County/Local Revenues (from State Department of Revenue) less Federal/State Funding Estimate	$ 52,390
Subtotal of Local Roadways		***$58,402***
Subtotal		**$ 66,365**
Total		**$205,277**

Figure 6-2 shows the annual federal and state funding program revenue estimates (in current dollars) based on recent funding levels over the past 5-6 years. The federal and state funding estimates were provided by WisDOT. Estimated annual funding for Major state highway projects and state highway and bridge preservation and TSM/safety construction projects is $69.9 million, while estimated funding for state highway maintenance and operations is $7.9 million, for a total of $77.8 million. Estimated federal and state funding for local roadway and bridge preservation and TSM/safety construction projects is $24.0 million, while estimated funding for maintenance and operations is $6.0 million, for a total of $30.0 million. This amounts to about 20% of total funding for local roadways. Local funding for local roadways was estimated by subtracting federal/state funding from total revenues.

Public Transit Funding

The major transit operator in the Madison area is Metro Transit, which is owned by the City of Madison and operates within the oversight of the Mayor, Common Council, and the City's Transit & Parking Commission. Metro contracts with other municipalities and public institutions (including UW-Madison, Madison College, and the Madison Metropolitan School District) to provide service for their constituents.

Metro 's capital and operating costs are funded through a combination of federal funding, state operating assistance, passenger fares, and local funds primarily derived from the property tax. Federal funding may be used for capital project expenses, preventive maintenance costs, and a portion may be used for complementary paratransit service for persons unable to use the regular fixed-routes.

The majority of Metro's federal funding comes from the Section 5307 Urbanized Area Formula Program (UAFP), which is apportioned based on revenue vehicle-miles, population, and population density. Metro's FY 2016 apportionment of Section 5307 UAFP funding was $7.7 million. Metro also receives Federal Section 5337 State of Good Repair and Section 5339 Bus and Bus Facilities formula programs. Funding for the Section 5337 program is based on the miles of bus lanes and other dedicated transit facilities, such as the State Street pedestrian and transit mall, while funding for the Section 5339 program is based on urbanized area population and bus passenger-miles traveled divided by operating costs. Metro's FY 2016 apportionment for these two programs combined was $1.6 million. Two discretionary components to the Section 5339 program were added under the recently approved FAST Act: a bus and bus facilities program based on asset age and condition and a low or no emissions bus deployment program.

Funding, in particular operating funds, has been and continues to be a major challenge for Metro. State operating assistance in 2015 was actually slightly lower than in 2010, dropping the percentage of Metro's operating expenses covered by the state from 35.6% to 31.6%. At one time in the mid-1990s state operating assistance covered 45% of Metro's operating budget. Figure 6-3 shows the distribution of Metro's operating revenue from 2011-2015. The percent covered by local funding has increased from 28.9% to 32.4% and the percent covered by fares has increased from 23.7% to 24.1%.

Because Metro must now use the majority of its federal funding for eligible operating expenses, this has put a squeeze on its capital budget, making it difficult to keep up with its bus fleet replacement schedule let alone address other capital needs.

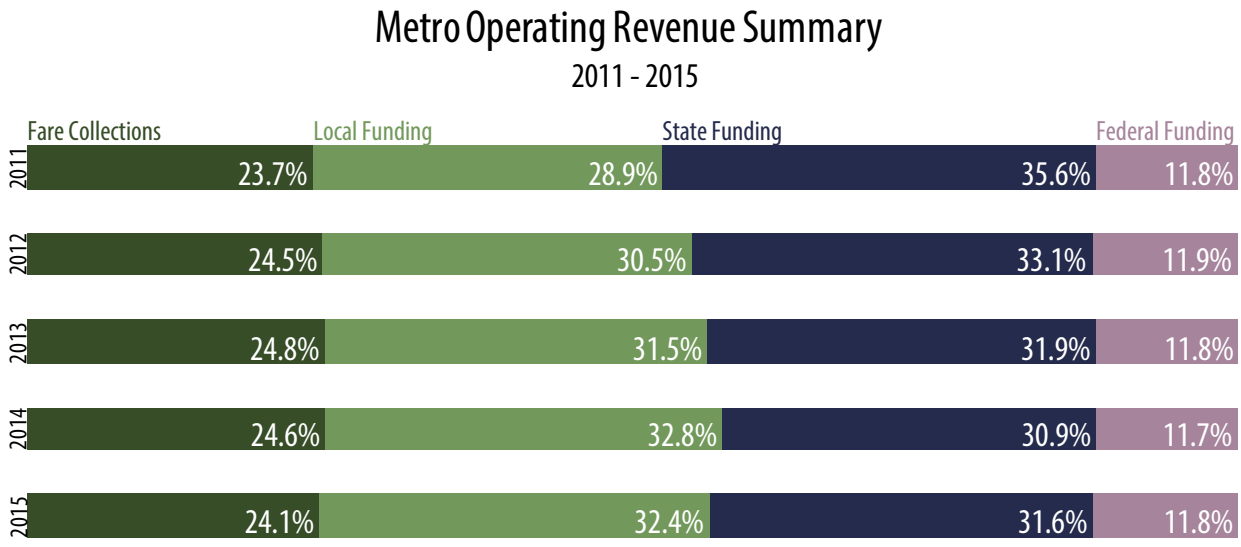


Figure 6-3: Metro Operation Revenue Summary

Given flat state funding and tight local budgets, in part due to the state expenditure restraint program, and the many other competing demands for property taxes, it will become increasingly difficult for Metro to cover inflationary operating cost increases in the future let alone meet the service improvement and expansion needs of the growing metro area and address its capital needs. A regional transit governance structure with a dedicated local source of transit funding will be needed in order to make major regional service improvements such as building out the full BRT system, initiating express commuter service to outlying communities, and increasing service frequency in the core area.



The state legislature adopted legislation in 2009 authorizing the creation of the Dane County Regional Transit Authority (DCRTA) with the authority to implement a local sales tax of up to ½ percent. The DCRTA was formed in 2010 and, with the help of City of Madison, Metro, and MPO staff, developed a draft short-term plan for improved transit service to support a referendum on a ¼ percent sales tax. However, Assembly Bill 40 (Act 32) was passed in 2011, eliminating the RTA authorizing legislation and dissolving the DCRTA.

Figure 6-4 shows Metro Transit's average capital and operating revenues from 2011-2015 based on the agency's National Transit Database (NTD) reports. Capital expenses fluctuated considerably, ranging from a low of $1.1 million in 2013 to $12.1 million in 2014, averaging $6 million annually. Operating expenses increased each year from $49.5 million in 2011 to $55.0 million in 2015, with a 5-year average of $52.4 million. The five-year average for capital and operating expenses combined was $58.4 million.

Figure 6-4

Annual Transit Revenue Estimates ($000's)

for the Madison Metropolitan Planning Area

Metro Transit	Funding Program	Avg. Funding ($000s)
Capital		
Federal Funding	Urbanized Area Formula Program (5307), State of Good Repair Formula Program (5337),Bus & Bus Facilities Formula Program (5339)	$ 4,830
Local Funding	City of Madison Property Taxes and Cooperative Agreements with Neighboring Municipalities	$ 1,208
Subtotal		**$6038**
Operating		
Federal Funding	Urbanized Area Formula Program (5307),Special Needs/ADA (5310)	$ 6,189
State Funding	State Operating Assistance	$ 17,063
Local Funding	City of Madison Property Taxes and Cooperative Agreements with Neighboring Municipalities, Advertising and Other Revenues	$ 15,674
Passenger and other General Revenue	Collections on Buses, Transit Passes, Advertising, etc.	$ 13,467
Subtotal		**$ 52,393**
Total		**$58,431**

Bicycle and Pedestrian Funding



Local sources provide most of the funding used for off-street bicycle and pedestrian facilities. This includes Dane County's relatively new PARC & Ride Bicycle Grant Program, which has provided over $750,000 in the past two years for grants to local communities for bicycle trail projects. Federal funding for off-street bicycle and pedestrian facilities is provided primarily through the Transportation Alternatives Program (TAP). MATPB receives an allocation of TAP funds, which it directs towards projects it selects. WisDOT also receives a TAP funding allocation, which it uses to fund projects throughout the state. Madison area projects are also eligible for this statewide pool of funds, and two projects were awarded funding in the 2015-2018 program cycle. Factoring in that additional funding along with MATPB's funding allocation, the average annual TAP funding has been $746,000. Off-street bicycle facilities, such as grade-separated crossings and side paths, have also been included in recent years as part of street construction projects funded by MATPB through the federal STBG (formerly STP) Urban program. Excluding the TAP funding, an average annual total of $4.05 million has been programmed for off-street bicycle projects in the past three Transportation Improvement Programs, resulting in an average total of $4.8 million in available funding each year. On street bicycle and pedestrian facility costs are included as part of street projects, and have no stand alone costs. As a result, no projections were generated for on-street facilities.

Figure 6-5

Annual Transit Revenue Estimates ($000's)

for the Madison Metropolitan Planning Area

Bicycle and Pedestrian Facilities	Funding Program	Avg. Annual Funding ($000s)
Off-Street Facilities		
Federal/State Funding	STBG - Transportation Alternatives Program (TAP) Set Aside	$ 746
Local and Other Funding	County PARC & Ride Bicycle Grant Program, Local municipal funding, Other	$ 4,054
Subtotal		$4,800

PROJECTED REVENUES THROUGH 2050

Figure 6-6 shows the projected total revenues for transportation projects for the next 34-year period from 2017 to 2050 assuming that recent funding levels remain relatively constant other than inflationary increases. It is estimated that a total of $13.3 billion could potentially be available to finance projects over the 34-year planning period. The federal and state roadway revenue estimates are based on a 6-year rolling average[1] of expended funds between 2011 and 2016 obtained from WisDOT. Local roadway revenue estimates on based on the 5-year average of expended funds from 2010-2014 obtained from State Department of Revenue reports after subtracting out federal and state funding received. Metro Transit capital revenues (federal and 20% local match) are based on the 5-year average from 2011-2015 in the agency's NTD reports. Metro operating funding (federal, state, and local) is based on the average annual percent increase in operating funding in constant dollars during the same period (0.7%) based on the NTD reports. Federal funding for off-street bicycle and pedestrian facilities is based on the current average annual allocation to MATPB for the FY 2016-2020 program plus additional funding received for FYs 2016-2018, while local and other funding is based on the average funding programmed in the past three TIPs (2015-'19, '16-'20, and '17-'21). Averages were extrapolated to 2050 using an inflation rate of 2 percent. In the case of transit operating revenues, the inflation rate was applied to the assumed average annual increase in constant dollars. Funds were then divided into three time periods (2017-2020, 2021-2035, and 2036-2050) reflecting programmed projects over the next four-year period to 2020 and then two subsequent 15-year increments.

[1] 5-year rolling average period for the General Transportation Aids and Connecting Highway Aids programs and Local Bridge program. Majors program funding is based on average annual amount enumerated for projects from FY 2014-2020.

Figure 6-6

Estimated Transportation Revenue, 2017 - 2050 ($000's)

for the Madison Metropolitan Planning Area

Source	2017-2020	2021-2035	2036-2050	Total
Roadway Construction				
State Highways				
Federal/State Funding	$279,505	$1,269,419	$1,708,470	$3,257,394
Local Roadways				
Federal/State Funding	$96,139	$436,633	$587,650	$1,120,423
Local Funding	$180,002	$817,509	$1,100,259	$2,097,770
Subtotal of Local Roadways	***$276,142***	***$1,254,142***	***$1,687,910***	***$3,218,193***
Subtotal of Roadway Construction	**$555,647**	**$2,523,560**	**$3,396,380**	**$6,475,587**
Roadway Maintenance and Operations				
State Highways				
Federal/State Funding	$31,855	$144,673	$194,710	$371,238
Local Roadways				
Federal/State Funding	$24,048	$109,216	$146,990	$280,254
Local Funding	$209,560	$951,750	$1,280,930	$2,442,239
Subtotal of Local Roadways	***$233,607***	***$1,060,966***	***$1,427,920***	***$2,722,493***
Subtotal of Maintenance and Operations	**$265,462**	**$1,205,638**	**$1,622,630**	**$3,093,731**
Metro Transit				
Capital				
Federal Funding	$20,583	$93,481	$125,813	$239,877
Local Funding	$5,146	$23,370	$31,453	$59,969
Subtotal of Capital	***$25,729***	***$116,851***	***$157,266***	***$299,846***
Operating				
Federal Funding	$28,548	$138,929	$207,604	$375,081
State Funding	$78,730	$383,142	$572,538	$1,034,410
Local Funding	$75,587	$367,849	$549,686	$993,122
Farebox	$58,860	$286,445	$428,041	$773,346
Subtotal of Operating	***$241,725***	***$1,176,365***	***$1,757,869***	***$3,175,959***
Subtotal of Metro Transit	**$293,182**	**$1,410,067**	**$2,072,402**	**$3,475,805**
Bicycle and Pedestrian Facilities				
On-Street Facilities	----included as part of street project funding ----			
Off-Street Facilities				
Federal/State Funding	$3,136	$14,244	$19,170	$36,550
Local Funding	$16,709	$75,887	$102,133	$194,729
Subtotal of Off-Street Facilities	***$19,845***	***$90,130***	***$121,303***	***$231,279***
Subtotal	**$19,845**	**$90,130**	**$121,303**	**$231,279**
Total Projected Revenue	**$1,134,136**	**$5,229,396**	**$7,212,716**	**$13,276,402**

PROJECTED EXPENSES THROUGH 2050

Figure 6-7 shows projected transportation expenses. Expenses are estimated at $12.8 billion for the planning period. Separate methodologies, detailed below, were developed to determine future expenses for roadway construction, maintenance, and operations; bicycle and pedestrian facilities; and Metro Transit capital and operating costs.

Figure 6-7

Estimated Transportation Expenses, 2017 - 2050 ($000's)

for the Madison Metropolitan Planning Area

Source	2017-2020	2021-2035	2036-2050	Total
Roadway Construction				
State Highways	$279,505	$1,269,419	$1,708,470	$3,257,394
Local Roadways	$263,269	$1,228,992	$1,724,617	$3,216,878
Subtotal	$542,774	$2,498,411	$3,433,087	$6,474,272
Roadway Maintenance and Operations				
State Highways	$31,855	$144,673	$194,710	$371,238
Local Roadways	$183,788	$857,961	$1,203,957	$2,245,706
Subtotal	$215,643	$1,002,633	$1,398,667	$2,616,943
Bicycle and Pedestrian Facilities				
On-Street Facilities	----included as part of street project funding ----			
Off-Street Facilities	$22,783	$80,003	$113,764	$216,550
Subtotal	$22,783	$80,003	$113,764	$216,550
Metro Transit				
Capital Expenses	$25,729	$116,851	$157,266	$299,846
Operating Expenses	$241,725	$1,176,365	$1,757,869	$3,175,959
Subtotal	$267,453	$1,293,216	$1,915,136	$3,475,805
Total Projected Expenses	**$833,010**	**$3,871,630**	**$5,461,987**	**$12,783,571**

Roadway Construction, Maintenance, and Operations

To begin the process of projecting expenses for construction, maintenance, and operations of the roadway network in the region, the revenue analysis was coupled with a pavement condition analysis to compare funding levels over the past five years to pavement conditions for all roadways by jurisdiction (state, local) and functional classification (arterial, collector, local). Overall, Interstate, US, and state trunk highway conditions in the Metropolitan Planning Area have been gradually improving in recent years as measured by Pavement Condition Index (PCI), which reflects the structural integrity of the roadway. PCI was developed by the US Army Corps of Engineers, and is based on a visual survey of the number and types of distresses in the pavement.[2] In contrast to state highway conditions in the Metro area, local roadway pavement conditions—as measured by a similar rating system as PCI called Pavement Surface Evaluation and Rating or PASER—have been steadily deteriorating during this same period. These outcomes can be tied to state funding priorities and challenges, some of which were discussed at the beginning of this section, and local funding challenges. Figure 6-8 provides a comparison of roadway conditions between 2013 and 2015. These years were not the only ones analyzed, but are the only two with complete data sets for state highways, City of Madison streets, and other local roads and streets.

Next, average roadway construction and roadway maintenance and operations costs were calculated for local streets, collectors, and local arterials within the City of Madison and other metropolitan area cities, villages, and towns by averaging the total lane miles in each municipality by the average annual costs between 2010 and 2014. Average maintenance and operations costs

[2] The Federal Highway Administration requires states to report highway conditions as measured by the International Roughness Index (IRI), which measures the smoothness of the roadway pavement. IRI data indicate the condition of state highways is in worse condition. WisDOT has indicated that Pavement Condition Index (PCI) is the more accurate and appropriate measure because IRI doesn't necessarily mean a roadway is in poor condition and needs extensive rehabilitation or maintenance work.

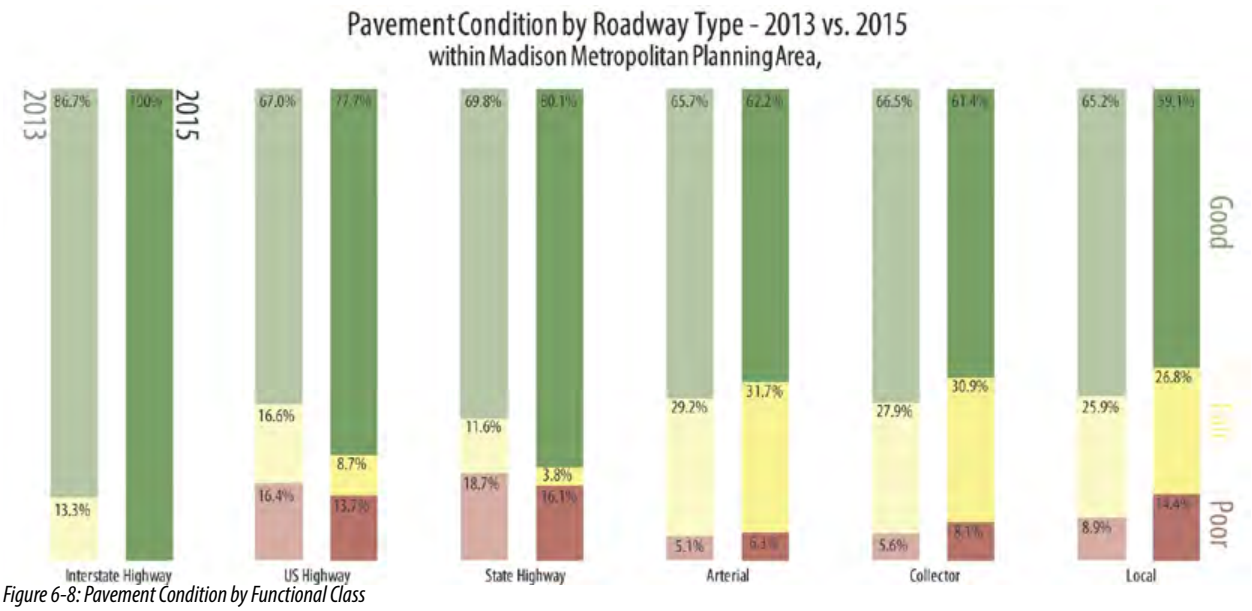


Figure 6-8: Pavement Condition by Functional Class

were highest within the City of Madison at over $10,915 per lane mile annually, compared to only $4,327 in towns. Construction costs were, surprisingly, highest in suburban cities bordering Madison, at over $18,211 per lane mile, compared to $14,968 for Madison and $13,304 for villages. These cost differences are likely due to the addition of new urban infrastructure when roads are reconstructed, such as street lights, curb and gutter, and urban furniture.

A lane mileage growth factor was calculated by comparing year-over-year growth of the local transportation network within the Metro area. The number of lane-miles of local roads has grown at a rate of 0.09%, while the growth rate for arterials was 0.9%. The growth rate, lane mileage cost, and inflation factor of 2 percent were applied to each spending category for municipal roads and extrapolated to 2050.

Using these assumptions, it is projected that $3.2 billion will be needed for local roadway construction over the 34-year planning period to 2050, while $2.2 billion will be needed for maintenance and operations. Projected local roadway revenues are $5.9 billion, resulting theoretically in a "surplus" of around $478 million. However, this additional revenue will likely be needed to fund preservation projects to avoid the continued deterioration of area roadways.



Because of the assumed increase in arterial lane miles, projected local roadway construction costs should include the cost of the major capacity expansion projects on local roadways listed in Appendix A. The cost of those projects total $247 million in inflation adjusted dollars over the planning period. If the cost of these projects isn't fully

covered, however, the "surplus" could cover any extra costs for them.



The projected "surplus" will be needed for additional roadway maintenance and non-capacity expansion construction projects in order to maintain or improve roadway network condition in the future. That is because the projected expenses will merely maintain existing trends – a steadily deteriorating local roadway system. An infusion of additional revenue will be needed to ensure that roadways receive preventive maintenance before significant deterioration, which can add 15-20 years of useful life at a substantial cost savings over reconstruction. Even with timely maintenance, streets eventually need to be reconstructed and utilities replaced.

Figure A-1 in Appendix A includes a list of programmed, planned, and other potential needed future high-cost arterial reconstruction projects based on current roadway condition and year the roadway was originally constructed (where that data was available). The total inflation adjusted cost of these projects over the planning period is $378 million. This includes some programmed and planned intersection and bridge projects. Some of the identified potential roadway reconstruction projects are in peripheral developing or planned development areas that will need to be reconstructed to urban standards, but many are in existing older developed areas.

The major source of funding for local arterial reconstruction projects is the STBG (formerly STP) Urban program for which MATPB receives an allocation of funding for each multi-year program cycle. The total amount of STBG Urban funding projected to be available over the 34-year planning period is $347 million, assuming 2% annual inflationary increases in funding. Using the current 60/40 cost share policy of MATPB, this would fund projects totaling $578 million. This would cover over 90% of the local arterial reconstruction projects (both capacity expansion and preservation) identified. Some of the projects listed will be funded locally and so even though some STBG Urban funding has been and will be used for other types of projects, this demonstrates the feasibility of funding the capacity expansion projects identified while still meeting major arterial preservation project needs in the region.

Recent trends demonstrate improving pavement conditions on the state highway system within the Madison metropolitan area. This analysis assumes that maintenance and operations will continue at current expenditure levels to the end of the planning period, with a 2% inflationary growth factor. While it would appear that the system would be maintained at a high level, it should be noted that the trend of improving state highway conditions over the past few years represents only a relatively small data sample. Based on the analysis conducted by WisDOT in 2013 and again in 2016 for the state transportation fund solvency study, a substantial increase in funding will be required just to maintain current pavement conditions. The trend in pavement condition of the state and local roadway systems will continue to be monitored. WisDOT is in the process of developmenting a State Highway Investment Plan, which will include an analysis of 20-year infrastructure investment needs.

Information produced from this planning effort will be incorporated into the next 5-year update of the RTP.

For state highway construction expenditures, programmed (or scheduled with funding attached) and other near-term (5-15 years) planned projects were identified and costs estimated using the 2% annual inflationary factor. See Figure A-1 in Appendix A. Included are WisDOT Major Highway Development program projects, specifically Interstate 39/90 expansion south of the Beltline and the Verona Road (US 18/151) expansion project. The only planned Major Highway Development program project included in the plan at this time is the Beltline/Interstate interchange. This project includes three phases, the third of which includes conversion of US 12/18 east of the interchange to a freeway with an interchange at CTH AB.

Other Major Highway Development program projects, which must be recommended for enumeration by the state Transportation Projects Commission (TPC) and enumerated by the Legislature and Governor, are not known at this time. This includes potential capacity expansion projects on the Beltline, Stoughton Road, and US 51 (McFarland to Stoughton) that are currently being studied, as well as the I-39/90/94 and WIS 19 / North Mendota Parkway corridors that are recommended for future study. The preferred roadway improvement alternatives for the Beltline and Stoughton Road corridors have not been determined. Once the studies are completed, the scope of specific improvements identified, costs estimated, and Major Highway Development program funding either secured or determined to be reasonably likely to be available, the plan will be amended to add the project(s) with an updated financial analysis. A preferred alternative for the US 51 (McFarland to Stoughton) corridor has been identified pending completion of the environmental study, however Major Highway Development program funding for the project is uncertain given the other potential Madison area projects for which such funding will be sought in the near future. If the US 51 (McFarland to Stoughton) project does not receive this funding, alternative sources may be needed and the project would then need to be completed in multiple segments over time.

Based on the funding for the Madison area projects enumerated for the Major Highway Development program for FYs 2014-2020, a total of $1.6 billion in inflation adjusted funding can be expected to be available during the planning period. This would cover the currently estimated inflation-adjusted cost of the Beltline/Interstate interchange ($550 million) with around $1 billion available for additional project(s). This would be sufficient to fund the Stoughton Road and US 51 projects should Major Highway Development program funding be sought for them or possibly the Beltline project. However, the region would need to garner a much larger percentage of the Major Highway Development program funding and/or total statewide funding would need to be significantly increased to fund the Beltline project, US 51 projects, and other needs such as the interstate in the Madison area. The Beltline project, which is expected to cost in excess of $1 Billion, would be expected to rate as a high priority under the project selection criteria, but would face competition from other major needs in the state, particularly on the southeast area freeway system.



Because the list of Major Highway Development program and other state highway construction projects is incomplete, a major surplus in funding remains, particularly in the last time period – 2035-2050. Because it is assumed that all available funding for construction will be expended, expenditures were adjusted to match revenues.

Public Transportation

Capital Costs

The single largest capital expense for Metro Transit by far is replacement buses. Metro typically replaces buses on a cycle of about 15 years. With a fleet of just over 200, it purchases about 15 new buses per year. Although the availability of traditional federal funding for replacement buses has decreased in recent years due to the elimination of discretionary transit capital funding in MAP-21 , Metro has been relatively successful in securing local and other federal funds necessary to maintain its fleet. MATPB awarded federal STBG Urban funds in 2015-'17 to purchase a total of 21 buses. Another major capital cost is the ongoing renovation of Metro's maintenance facility. Maintaining Metro's fleet replacement schedule, the facility renovation, and other usual capital expenses can be covered with projected revenues based on recent trends.

However, in order to fully implement the recommended transit system improvements there are some major new capital costs that will require significant additional funding. The two most immediate capital needs are a new bus storage and maintenance facility and bus rapid transit (BRT) infrastructure. In addition, new buses in the future will likely be electric and some may be longer, high-capacity articulated buses. The planned Nakoosa Trail bus storage and maintenance facility is estimated to cost about $35 million. Final design work for the facility will be done this year. The new facility is necessary for Metro to be able to expand its peak period service area and frequency, and to house and maintain articulated buses, which will be needed for the BRT system. Metro has unsuccessfully applied for discretionary federal TIGER grant funding in the past, but plans to apply again in 2017, assuming the program is continued.

Detailed costs for the planned BRT system are not known, but a feasibility study completed in 2013 estimated that the 20-mile system envisioned would cost between $105 and $155 million, excluding the cost for the bus storage and maintenance facility. Costs for BRT vary greatly based on the scope of the project. The system envisioned in the feasibility study includes new articulated buses, new stations, and some roadway modifications. A planned 2017 study will provide more detailed cost estimates for a first phase project, which could be constructed, and in service by 2021-'22. Capital funding is anticipated to be provided through a federal Small Starts program grant covering up to 80% of project costs. If other federal funding is not secured, the Small Starts grant could also cover up to one-half of the cost of the new satellite bus storage and maintenance facility, which is needed for the BRT buses. The City of Madison has included required local match funding for the starter BRT project and facility in its multi-year capital budget. Funding for the study and BRT project design is available from previous federal grants and state funding. Once the 2017 study is completed and the initial BRT project identified with an estimated cost, an amendment to the RTP is anticipated to add the project to the fiscally constrained, federally recognized plan.

New articulated and electric buses, as recommended in the plan, will be more expensive than the standard 40-foot diesel buses and hybrid-electric buses currently in use. Electric buses have become more common as the technology improves and the price drops. Articulated buses have been in use in the industry for many years. With the new service planned (bus rapid transit, new all-day service, frequency improvements, and regional express service), the fleet size is expected to grow by about 70 buses, including spares. If all of the recommended service improvements in the plan are implemented, the capacity of Metro's primary and planned satellite facilities will be largely exhausted. Future expansion of the fleet would require additional storage capacity.

Table 6-9 lists the major capital expenses necessary to fully implement the recommended transit improvements. The total estimated cost in today's dollars is over $300 million – far more than Metro is likely to receive based on historical trends. The recent average annual spending on capital needs is about $6 million, which is generally sufficient for meeting Metro's bus replacement needs, but not for expanding or upgrading the fleet. Some expansion of the fleet for new service and/or upgrading of the fleet to electric buses may be feasible with other federal funding and increased local funding, but implementation of the full suite of planned improvements would not be possible. Metro will need to fund the new maintenance facility to accommodate planned service expansion regardless of whether it pursues BRT.

While Metro may be able to secure discretionary federal grants for the Nakoosa Trail bus storage and maintenance facility and initial BRT project, funding the complete list of capital needs identified in the plan will likely require a regional funding mechanism.

Figure 6-9

Estimated Costs of Needed Transit System Capital Projects

Major Capital Expense	Estimated Cost in Millions
Bus Rapid Transit System with buses and Nakoosa Trail bus storage and maintenance facility	$165
Second satellite bus storage and maintenance facility	$35
Fleet expansion for new all-day service and regional express service	$30
Upgrade standard 40-foot buses to electric buses with some articulated buses	$75
Grand Total	**$305**

Operating Costs

Implementing the service improvements recommended in this plan will require an estimated additional 255,000 annual service hours, a 63% increase. See Figure 6-10. This planning-level estimate includes the BRT service, new all-day service, frequency improvements in central Madison, and the network of regional express bus routes. Assuming the service improvements are phased in over the approximately 34-year plan time-frame, the increase translates to about 1.5% per year.

Figure 6-10

Estimated Annual Service Hours for Recommended Regional Transit System

Service Category	Estimated Annual Revenue Service Hours	Estimated Cost in Millions
Existing Metro Transit Service	406,000	$55
Bus Rapid Transit	104,000	$14
New All-Day Service	88,000	$12
Frequency Improvements	7,000	$1
Regional Express Service	56,000	$8
Grand Total	**661,000**	**$90**

This 1.5% growth rate is considerably higher than Metro's historical growth rate of about 0.9% per year since 2003. Before 2003, there had actually been a trend of decreasing service hours following the route restructure and expansion in 1998. Between 2010 and 2015, Metro Transit's operating funding increased an average of 0.7% per year in constant 2015 dollars. This increase allowed for some increased service – in fact, during that same time period, service hours actually increased at an average of 1.4% per year. However, this level of funding would not provide the resources necessary to support the transit service recommendations in this plan. Because service hours rose faster than operating funding, some hours were added through improved efficiencies, and there are limits to these efficiency gains. Also, increased funding has come from local governments, and competing funding demands and the state expenditure restraint program make its continuation unlikely.

If the number of service hours was to increase at the same rate as operating funding has risen – 0.7% per year – Metro could expect to be able to operate about 112,000 additional annual service hours by 2050, slightly less than one-half of the service hours recommended in this plan. The remaining unfunded 143,000 annual service hours will require a new funding source. See figure 6-11.

Figure 6-12 identifies the types of revenue generation mechanisms that could be used to fund the expansion of the transit system as well as the estimated annual revenue generation of these sources. A vehicle registration fee alone would not be enough to fund the planned transit system, but would allow Metro to make targeted service expansions and pursue needed capital improvements. A ¼ percent sales tax would likely be sufficient to fund a steady implementation of the planned transit system while a ½ percent sales tax would act as a safeguard against future state and federal funding reductions, and allow faster implementation of the planned system. It is important to note that an RTA could be used to fund transit alone or all modes of transportation depending on the statutory language in the enabling legislation. The recommendations above assume all funds are allocated to transit. If funds are divided between modes, additional funding may be required to implement the planned transit system.

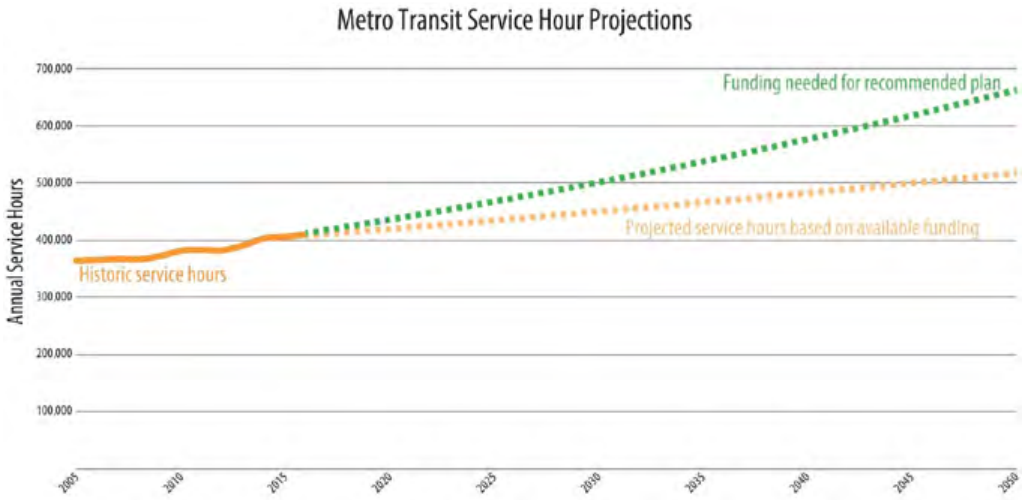


Figure 6-11: Metro Transit Service Hour Projections

Figure 6-12

Estimated Annual Revenue Generated from New Taxing Authority

Revenue Source	Estimated Cost in Millions
RTA - ¼ % Sales Tax	$23
RTA - ½ % Sales Tax	$46
Vehicle Registration Fee - $20 per year	$8

Bicycle Projects

New urban arterial streets and high-volume collector streets are almost universally built with bicycle facilities. Urban arterial street reconstruction projects generally include bicycle facilities, where feasible, given right of way constraints and competing demands for the space. The cost of these facilities is included in the budget for street projects. Therefore, no additional need for funding is anticipated for on-street bicycle facilities beyond that projected for the roadway system. Major regional off-street facilities, such as shared-use paths, are generally stand-alone projects, although some side paths and grade-separated crossings are now being funded as part of roadway projects such as those on CTH M and CTH PD. The *2015 Bicycle Transportation Plan* identified a network of planned regional priority paths and estimated the cost for these projects. Figure A-2 in Appendix A lists these projects and a planning level cost estimate for them. There are also some major shared-use path and grade-separated crossing recommendations that have been identified as part of major state highway corridor projects, most notably the Beltline and Stoughton Road. It is expected that at least some of those projects would be funded as part of those projects.

Bicycle project costs were estimated for the *2015 Bicycle Transportation Plan* based on planning-level cost assumptions, taking into account the length of the path, character of the corridor, and presence of bridges and underpasses. Programmed projects were then assigned a construction year and, as with the roadway projects, the longer term projects were assigned to one of two time periods – 2021 to 2035 and 2036 to 2050. Project costs include a 2% per year inflationary factor. The costs of these regional priority projects, about $80 million in 2021-2035 and $114 million in 2036-2050, are forecasted to be within the projected funds

available ($90 million in 2021-2035 and $121 million in 2036-2050). Other path projects included in the bicycle facilities plan may be completed with urban development projects, in conjunction with roadway construction projects, or may be funded separately.

CONCLUSION

The financial capacity analysis for the RTP assumes a 2% annual inflationary increase in federal, state, and local funding. However, the state gasoline tax rate will need to be increased, or other new revenue sources (e.g., new mileage based registration fee) created, in order to offset inflationary increases in project costs. The state gas tax hasn't been increased since, 2006 when the automatic indexing of the gas tax and vehicle registration fees to the inflation rate was eliminated. The State Commission on Transportation Finance and Policy's report, *Keep Wisconsin Moving – Smart Investments, Measurable Results*, provided recommendations for generating additional revenue, but thus far the state legislature has not addressed the long-term solvency of the state transportation fund.

An increase in funding levels is necessary to maintain the existing condition of the region's roadway system. The overall condition of the state highway system has improved the past few years, but necessary major reconstruction projects loom on the horizon. Also, a WisDOT analysis of the statewide system indicates that spending at the same level as the current budget will result in a 93% increase in state highway miles rated in poor or worse condition by FY 2027. The overall condition of the local roadway system has been steadily deteriorating. It is difficult to estimate the level of increase in funding that would be necessary to maintain or improve the condition of local roadways in the region, but clearly the current level of funding is insufficient.

The financial analysis indicates that projected revenues will be sufficient to implement the state and local arterial roadway capacity expansion projects identified in Figure 5-2 in Chapter 5 and listed in Figure A-1 in Appendix A while at the same time addressing roadway preservation needs in a manner similar to recent trends. However, this means that roadway conditions, at least on the local system, will continue to slowly deteriorate. Major capacity improvements in two state highway corridors (Stoughton Road, Beltline) currently being studied would probably not all be able to be fully funded with current funding levels – the Beltline project alone is expected to cost over $1 billion. Major Highway Development program projects funding, which is provided on a statewide discretionary basis, will be sought for these projects. Some local arterial capacity expansion needs will not be able to be addressed without additional funding, most notably the western segment of the planned North Mendota Parkway.

Significant new transit funding will be needed to implement the recommended regional transit service improvements, including BRT, new regional commuter service, and increased local service frequencies in high-demand corridors. The estimated costs to fully implement the plan include over $300 million in capital costs and a 63% increase in annual service hours at an estimated additional annual cost of $45 million. Implementation of these improvements will likely require a new regional funding mechanism, such as a regional transit authority, with the ability to levy a sales tax. It is estimated that a ½ cent sales tax today would generate $46 million annually.

Current funding levels, adjusted annually for inflation, would be sufficient to fund the major regional priority path projects illustrated in Figure 5-8 in Chapter 5 and listed in Figure A-2 in Appendix A. These projects were identified as needed to address key gaps and barriers, and complete the planned primary regional network found in Figure 5-10 in Chapter 5. Additional identified projects would need to be completed in conjunction with new development, as part of roadway construction projects or with additional funding. On-street facilities are assumed to be included as part of roadway projects.



APPENDIX

- A: Project and Policy Recommendations
- B: Environmental Justice Analysis
- C: Environmental Analysis
- D: Map Book
- E: MPO Composition and History
- F: Pedestrian Facilities Toolbox
- G: Public Participation and Responses to Comments
- I: Travel Model Summary Statistics
- H: Performance Measures Report

Figure A-1

ARTERIAL STREET/ROADWAY IMPROVEMENTS: 2017-2050

1. Capacity Improvements & Studies Already Programmed

FACILITY	SEGMENT	IMPROVEMENT (1)	EST. MILES	ESTIMATED TIMING (2) AND PRELIMINARY COSTS (3) (000s) 2017 to 2020	2021 to 2035	2036 to 2050	PRIMARY FUNDING SOURCE(S)	COMMENTS
Roadway Segments (4)								
State								
Verona Rd. (US 18/151)	Nakoma St. to Raymond Rd.	6 to 8-lane divided facility	0.7	Cont.			NHPP	Beltline, Beltline interchange completed
Verona Rd. (US 18/151)	Raymond Rd. to McKee Rd./CTH PD	6-lanes w/ new interchanges	1.2	89,600			NHPP	Interchanges at Williamsburg Way, CTH PD
WIS 19	River Rd. to Interstate 39/90	4-lane divided facility	0.7	7,309			NHPP	Includes Yahara R bridge replacement
		State Project Subtotal	2.6	96,909				
Local								
CTH M (S. Pleasant View Rd.)	Valley View Rd. to Cross Country Rd.	4 to 6-lane divided facility	2.7	40,263			STBG Urban	Incl. grade sep. intersection at CTH PD
Cottage Grove Rd. (CTH BB)	North Star Dr. to Sprecher Rd.	4-lane divided facility	1.0	6,102			STBG Urban	
McKee Rd. (CTH PD)	Meriter Way to Maple Grove Dr.	4-lane divided facility	1.6	13,342			STBG Urban	
Nine Mound Rd.	Cross Country Rd. to CTH PD	4-lane divided facility	1.4	Cont.			Local	
		Local Projects Subtotal	11.9	19,444				
		Total Roadway Segments	14.5	116,353				
Interchanges and Bridges								
W. Beltline (US 12/14)	S. High Point Rd. Bridge	Replace, expand to 4 lanes		Cont.			NHPP	
Interstate 39/90	Cottage Grove Rd. Bridge	Replace, expand to 4 lanes		3,917			NHPP	Const. of second structure
Verona Rd. (US 18/151)	Williamsburg Way, CTH PD Interchanges	New Interchanges					NHPP	Part of Verona Rd. expansion project
		Subtotal Bridges		3,917				
Studies								
W. Beltline (US 12/14/18/151)	US 14 to CTH N	Major corridor study (EIS)		15,918			NHPP	Possible continuation until 2024
Interstate 39/90	Beltline interchange area	Major corridor study (EIS)		3,641			State	Incl. US 12/18 from US 51 to CTH AB
US 51 (Stoughton Rd.)	Terminal Dr. to WIS 19	Major corridor study (EIS)		Cont.			NHPP	Ongoing
US 51	McFarland to Stoughton	Major corridor study (EIS)		Cont.			State	Recommended alternative identified
		Subtotal Studies		19,560				
		Grand Total		**139,830**				

(1) For planning level cost estimating purposes only. Design, magnitude of improvement, and cost is subject to more detailed levels of planning and environmental study.

(2) Projects may not be able to be implemented or the schedule may be modified due to future changes in available revenue, priorities, or other factors not known at this time.

(3) Costs are for construction only and are year-of-expenditure assuming a 2.0% annual inflationary factor.

(4) Projects outside of the MPO Planning Area, not included in the financial analysis are as follows:

(a) Interstate 39/90 (Siggelkow Rd. Bridge to Rock County Line), Reconstruct and expand to 6 lanes w/ new bridges and interchanges

ARTERIAL STREET/ROADWAY IMPROVEMENTS: 2017-2050 (CONTINUED)

2. Planned Capacity Improvements

FACILITY	SEGMENT	IMPROVEMENT (1)	EST. MILES	ESTIMATED TIMING (2) AND PRELIMINARY COSTS (3) 2017 to 2020	2021 to 2035	2036 to 2050	PRIMARY FUNDING SOURCE(S)	COMMENTS
Roadway Segments (4)								
State								
[Note: Projects to be identified following completion of environmental studies of the Beltline, US 51/Stoughton Road, US 51 (McFarland to Stoughton), and WIS 19/WIS 113/CTH M. See Section 5 of this table listing "illustrative" projects pending environmental study and identification of funding.]								
Local								
Buckeye Rd. (CTH AB)	Relocated Sprecher Rd. to US 12/18	4-lane divided facility	2.6			27,143	STBG Urban or Local	
CTH D (Fish Hatchery Rd.)	Lacy Rd. to Nobel Dr.	4-lane divided facility	0.4		3,151		STBG Urban or Local	
CTH M	Willow Rd. to CTH K	4-lane divided facility	1.1		8,429		STBG Urban or Local	
CTH PD	CTH M to West of Shady Oak Ln.	4-lane divided facility	1.2		9,454		STBG Urban or Local	
CTH Q	Oncken Rd. to CTH M (Century Ave.)	4-lane divided facility	1.8		14,181		STBG Urban or Local	
CTH T (Commercial Ave.)	N. Thompson Dr. to Reiner Rd.	4-lane divided facility	1.7			18,025	STBG Urban or Local	
Hoepker Rd.	US 51 to Portage Rd.	4-lane divided facility	1.0		7,878		STBG Urban or Local	
Hoepker Rd.	Portage Rd. to Rattman Rd./American Pkwy.	4-lane divided facility	0.5		3,939		STBG Urban or Local	
Hoepker Rd.	US 51 to CTH CV	4-lane undivided facility	0.5		2,679		NHPP, STBG Urban, or Local	Part of US 51 imp.
Lien Rd.	City View Dr. to Felland Rd.	4-lane divided facility	0.6		3,361		STBG Urban or Local	Southern section only
Lien Rd. Extension	Felland Rd. to Reiner Rd.	New 4-lane divided facility	0.5		3,861		STBG Urban or Local	
Mid town Rd.	Muir Field Rd. to CTH M (S. Pleasant View)	New 4-lane divided facility	1.3			14,102	STBG Urban or Local	Pt. on new alignment
Mineral Point Rd. (CTH S)	S. Pleasant View Rd. to Veritas Dr.	4-lane divided facility	0.9		7,090		STBG Urban or Local	
Mineral Point Rd. (CTH S)	Veritas Dr. to Pioneer Rd.	4-lane divided facility	0.8			8,482	STBG Urban or Local	
Nelson Rd.	High Crossing Blvd. to Reiner Rd.	4-lane divided facility	0.9			9,224	STBG Urban or Local	
Packers Ave. (CTH CV)	Tennyson Ln. to Wheeler Rd.	4-lane undivided facility	0.9			6,362	STBG Urban or Local	
N. Pleasant View Rd.	US 14 to Greenway Blvd.	4-lane divided facility	0.9		13,787		STBG Urban or Local	
N. Pleasant View Rd.	Greenway Blvd. to Timber Wolf Trail	4-lane divided facility	0.6		4,197		STBG Urban or Local	
N. Pleasant View Rd.	Timber Wolf Trail to Mineral Point Rd.	4-lane divided facility	0.9		6,422		STBG Urban or Local	
Reiner Rd.	O'Keeffe Ave. to Lien Rd. extended	4-lane divided facility	2.5			25,977	STBG Urban or Local	

ARTERIAL STREET/ROADWAY IMPROVEMENTS: 2017-2050 (CONTINUED)

2. Planned Capacity Improvements

FACILITY	SEGMENT	IMPROVEMENT (1)	EST. MILES	ESTIMATED TIMING (2) AND PRELIMINARY COSTS (3) 2017 to 2020	2021 to 2035	2036 to 2050	PRIMARY FUNDING SOURCE(S)	COMMENTS
Reiner Rd.	Lien Rd. extended to CTH T	4-lane divided facility	1.0			10,391	STBG Urban or Local	
Sprecher Rd.	CTH T to Milwaukee St.	6-lane divided facility	0.5		5,357		STBG Urban or Local	
Sprecher Rd.	Sharpsburg Dr. to Buckeye Rd. (CTH AB)	4-lane divided facility	1.2		9,454		STBG Urban or Local	
Watts Rd.	CTH M to Pleasant View Rd.	4-lane divided facility	0.6		4,727		STBG Urban or Local	
		Subtotal Roadway Segments	24.8		107,966	119,705		
Interchanges and Bridges								
Interstate 39/90	Beltline (US 12/18) Interchange (BIC)	Reconfigured Interchange			550,000		Majors program	Part of I-39/90 project
Interstate 39/90	Hoepker Rd. Bridge	Replace, expanded to 4 lanes			6,217		NHPP	
US 12/18	CTH AB Interchange	New Interchange					Majors program	Phase 3 of BIC Proj
		Subtotal Interchanges			556,217	0		
Studies								
WIS 19/WIS 113/CTH M	US 12 to US 151	Future Major corridor study (EIS)					Funding undetermined	
		Subtotal Studies						
		Grand Total	24.8		664,183	119,705	783,888	

(1) For planning level cost estimating purposes only. Design, magnitude of improvement, and cost is subject to more detailed levels of planning and environmental study.

(2) Projects may not be able to be implemented or the schedule may be modified due to future changes in available revenue, priorities, or other factors not known at this time.

(3) Costs are year-of-expenditure assuming a 2.0% annual inflationary factor.

(4) Projects outside of the MPO Planning Area, not included in the financial constraint requirement are as follows:

(a) I-39/90 (Beltline (US 12/18) to County Line), 6-lane freeway, 20.1 miles, IM funds (2026 to 2035 time period); part of larger project to IL State line.

ARTERIAL STREET/ROADWAY IMPROVEMENTS: 2017-2050 (CONTINUED)

3. Arterial System Preservation, TSM, and Safety Projects Already Programmed (Cost > $1.0 million)

FACILITY	SEGMENT	IMPROVEMENT (1)	EST. MILES	ESTIMATED TIMING (2) AND PRELIMINARY COSTS (3) (000s) 2017 to 2020	2021 to 2035	2036 to 2050	PRIMARY FUNDING SOURCE(S)	COMMENTS
Roadway Segments (4)								
State								
W. Beltline (US 12/14/18/151)	Verona Rd. to Fish Hatchery Rd.	Resurfacing	2.0	6,610			NHPP	
US 51 (Stoughton Rd.)	Broadway St. to Milwaukee St.	Resurfacing of SB lanes	3.5	Cont.			NHPP	NB lanes const. in 2015
US 51 (Main St.)	Page Street to Hoel Avenue	Pavement rehabilitation	1.2	1,675				
US 151	Main St. to CTH VV	Resurfacing w/ bridge decks overlay	3.9	9,635			NHPP	
		State Projects Subtotal	10.6	17,920				
Local								
CTH CV	CTH V to Vinburn Rd.	Reconstruct to urban standards	1.0	2,576			Local	
CTH MN (Farwell St.)	US 51 to Lake St.	Resurfacing	0.6	936			Local	
CTH MS (University Ave.)	Cayuga St. to Allen Blvd.	Pavement replacement	1.6	4,000			Local	
CTH Q (S. Century Ave.)	Woodland Dr. to WIS 19 (W. Main St.)	Resurfacing	1.0	2,000			Local	
CTH V (North St.)	North Towne Rd. to N. Main St. (CTH CV)	Reconstruct to urban standards	0.8	2,463			Local	
Atwood Avenue	First St. to Winnebago St.	Reconst. with intersection improvements	0.2	2,621			Local	
Atwood Avenue	Fair Oaks Ave. to Walter St.	Reconstruct to boulevard street	0.7	5,688			STBG Urban	Includes Walter intersec. imp.
Buckeye Rd. (CTH AB)	Monona Dr. to Stoughton Rd. (US 51)	Reconstruct to urban standards	0.8	2,216			STBG Urban	
Gammon Rd.	Mineral Point Rd. to Beltline (US 12/14)	Pavement replacement	0.4	3,714			Local	
E. Johnson St.	Baldwin St. to First St.	Reconstruction w/ First St intersection imp.	0.5	5,056			STBG Urban	
Lacy Rd.	Fitchburg City Hall to Syene Rd.	2-lane facility w/ bike lanes	1.3	4,726			STBG Urban	Incl. roundabout at Fahey Glen
McKee Rd. (CTH PD)	Commerce Park Dr. to Seminole Hwy.	Reconstruction w/ intersection imp.s	0.6	6,165			STBG Urban	Incl. ped/bike underpass
Milwaukee St.	Stoughton Rd./US 51 to Thompson Dr.	Resurfacing	1.4	874			Local	
Mineral Point Rd.	Beltline to S. High Point Rd.	Pavement replacement	0.2	1,411			STBG Urban	
Monroe Street	Odana Rd. to Regent St.	Resurfacing	1.7	15,208			Local	
Outer Capitol Loop (South)	MLK Jr Blvd. to S. Webster St.	Reconstruction	0.1	1,920			Local	
S. Park Street	Badger Rd. to Union Pacific RR	Concrete joint repair	0.6	2,531			Local	
S. Park Street	Olin Ave. to W. Washington Ave.	Concrete joint repair	0.7	2,679			Local	

ARTERIAL STREET/ROADWAY IMPROVEMENTS: 2017-2050 (CONTINUED)

3. Arterial System Preservation, TSM, and Safety Projects Already Programmed (Cost > $1.0 million)

FACILITY	SEGMENT	IMPROVEMENT (1)	EST. MILES	ESTIMATED TIMING (2) AND PRELIMINARY COSTS (3) (000s) 2017 to 2020	2021 to 2035	2036 to 2050	PRIMARY FUNDING SOURCE(S)	COMMENTS
Siggelkow Rd.	Marsh Rd. to Terminal Dr.	Reconstruction to urban standards	0.8	2,585			Local	
W. Washington Avenue	Regent St. to Bedford St.	Pavement replacement	0.2	2,232			Local	
E. WIson St./Williamson St.	Franklin St. to Blount St.	Reconstruction	0.2	1,955			Local	
Winnebago St.	Atwood Ave. to Bashford St.	Reconstruction	0.3	1,649			Local	
University Ave.	Aurora St. to Parmenter St.	Reconstruction	0.1	1,298			Local	
		Local Projects Subtotal	15.8	76,504				
		Total Roadway Segments		94,424				
Interchanges/Intersections								
State								
US 51	WIS 138 and Silverado/Hoel Ave Intersections	Reconstruct w/ roundabouts		5,566			NHPP	
WIS 19	Broadway Dr. Intersection	Reconstruct, reconfigure intersection		1,464			HSIP	
WIS 19	WIS 113 and CTH I Intersection	Reconstruct, reconfigure intersection		4,685			NHPP/HSIP	
Local								
Atwood Ave.	Williamson St/Winnebago St. Intersection	Reconstruct (pt), reconfigure intersection		2,621			Local	
		Interchanges/Intersections Subtotal		14,336				
Bridges								
State								
S. Belltine (US 12/18)	Yahara River Bridges	Bridge deck overlay		Cont.			NHPP	
W. Beltline (US 12/14)	Terrace Ave. Bridges	Briddge deck rehab or replacement		2,296				
Interstate 39/90	Milwaukee St. Bridge	Bridge deck replacement		1,357			NHPP	
Interstate 39/90/94	CTH DM Bridge	Bridge replacement		2,339			NHPP	
Interstate 39/90/94	River Rd. Bridge	Bridge deck overlay		Cont.			NHPP	
Interstate 94	Bridge(s) east of CTH N	Bridge replacements		3,566			NHPP	Cost includes other bridges
US 12/18	New Meier Rd. Bridge	Street extension and new bridge		4,714			State	Part of I-39/90 expansion project
US 14	McCoy Rd. and Byrne Rd. Bridges	Bridge deck repl., WB bridge repl.		4,385			NHPP	
Local								
CTH AB	Yahara River Bridge	Bridge replacement		1,208			BR	

CTH PB	Badger Mill Creek Bridge	Bridge replacement		407	NHPP	
		Bridges Subtotal		17,975		
Studies US 12	Parmenter St. to WIS 19	Freeway conversion study		Cont.		
		Subtotal Studies				
		Grand Total	**26.4**	**144,655**		

(1) For planning level cost estimating purposes only. Design, magnitude of improvement, and cost is subject to more detailed levels of planning and environmental study.

(2) Projects may not be able to be implemented or the schedule may be modified due to future changes in available revenue, priorities, or other factors not known at this time.

(3) Costs are year-of-expenditure assuming a 2.0% annual inflationary factor.

(4) Projects outside or mostly outside of the MPO Planning Area, not included in the financial analysis are as follows:

(a) US 151 (CTH VV to WIS 73), Resurfacing, Const. in 2018

ARTERIAL STREET/ROADWAY IMPROVEMENTS: 2017-2050 (CONTINUED)

4. Planned Arterial System Preservation, TSM, and Safety Projects (Cost > $1.0 million)

FACILITY	SEGMENT	IMPROVEMENT (1)	EST. MILES	ESTIMATED TIMING (2) AND PRELIMINARY COSTS (3) 2017 to 2020	2021 to 2035	2036 to 2050	FUNDING SOURCE(S)	COMMENTS
Roadway Segments (4)								
State								
W. Beltline (US 12/14)	Whitney Way to Gammon Rd.	Resurfacing w/ structure work	1.5		2,143		NHPP or State	
US 14	WIS 138 to WIS 92	Resurfacing w/ intersection improvements	4.9		3,494		State	Const. in 2021
US 18/151	CTH PD to W. Verona Ave.	Resurfacing	7.0		9,826		NHPP	Const. scheduled in 2021
US 18/151	W. Verona Ave. to Town Hall Rd.	Resurfacing	6.7		8,691		NHPP	Const. scheduled in 2022
US 51/Stoughton Rd.	E. Washington Ave. to Pierstorff St.	Concrete joint repair and overlay	0.8		3,954		NHPP or State	
US 151	East Springs Dr. to Main St.	Resurfacing	5.4		6,856		State	Const. scheduled in 2022
US 151 (Blair St.)	E. Washington Ave. to Williamson/Wilson St.	Pavement replacement w/ intersection imp	0.3		1,773		Federal/State, Local	
US 151 (Park St.)	Union Pacific RR to Olin Ave.	Reconstruction	0.5		4,165		State and Local	
US 151 (Park St.)	Union Pacific RR to Badger Rd.	Reconstruction	0.6		5,121		Federal/State, Local	
US 151 (Park St.)	Olin Ave. to W. Washington Ave.	Reconstruction	0.7		5,974		Federal/State, Local	

ARTERIAL STREET/ROADWAY IMPROVEMENTS: 2017-2050 (CONTINUED)

4. Planned Arterial System Preservation, TSM, and Safety Projects (Cost > $1.0 million)

FACILITY	SEGMENT	IMPROVEMENT (1)	EST. MILES	ESTIMATED TIMING (2) AND PRELIMINARY COSTS (3) 2017 to 2020	2021 to 2035	2036 to 2050	FUNDING SOURCE(S)	COMMENTS
WIS 19	CTH N to CTH VV	Resurfacing	2.0		1,050		State	Larger project to WIS 73
		State Projects Subtotal	28.9		50,906			
Local								
Aberg Ave.	Sherman Ave. to Rail Line	Reconstruction	0.3		1,576		STBG Urban or Local	
Allen Blvd.	Century Ave. to University Ave.	Reconstruction	1.0		7,878		STBG Urban or Local	
Anderson St.	Hoffman St. to Pankratz St.	Reconstruction to urban standards	0.8		3,676		STBG Urban or Local	
Atwood Ave.	First St. to Winnebago St.	Reconstruction	0.1		525		STBG Urban or Local	
Atwood Ave.	Division St. to Fair Oaks St.	Reconstruction	0.5		2,626		STBG Urban or Local	
Atwood Ave.	Walter St. to Cottage Grove Rd.	Reconstruction	0.5		3,615		STBG Urban	Const. scheduled in 2021
Bird St.	W. Main St. to Linnerud Dr.	Reconstruction	0.5		4,153		STBG Urban or Local	
N. Blair St.	Johnson St. to E. Washington Ave.	Pavement replacement	0.2		919		Local	
N. Bristol St. (CTH N)	Stonehaven Dr. to Klubertanz Dr.	Reconstruction	0.2			2,121	STBG Urban or Local	
Buckeye Road (CTH AB)	Thompson Dr. to relocated Sprecher Rd.	Reconstruction to urban standards	1.0			5,301	STBG Urban or Local	
Cottage Grove Rd.	Stoughton Rd./US 51 to S. Thompson Dr.	Reconstruction	1.2			12,723	STBG Urban or Local	
CTH BB (W. Cottage Grove Rd.)	N. Main St. to Sandpiper Trail	Reconstruction	0.8		4,202		STBG Urban or Local	
CTH CV (N. Main St.)	Vinburn St. to Windsor Rd.	Reconstruction	1.5		5,909		STBG Urban or Local	
CTH CV (N. Main St.)	Windsor Rd. to WIS 19	Reconstruction	1.5			7,952	STBG Urban or Local	
S. Division St.	E. Main St./WIS 19 to Woodland Dr.	Reconstruction	1.0			5,301	STBG Urban or Local	
Eastwood Dr.	Division St. to First St.	Reconstruction	0.3		1,182		Local	
N. Fair Oaks St.	Lexington Ave. to Commercial Ave.	Reconstruction	0.2			1,237	Local	
Femrite Dr.	Meier Rd. to CTH AB	Reconstruction to urban standards	1.0			5,301	STBG Urban or Local	
Fish Hatchery Rd.	S. Park St. to Wingra Dr.	Reconstruction	0.5		2,626		STBG Urban or Local	
Fitchrona Road	Lacy Rd. to Nesbitt Rd.	Reconstruction to urban standards	0.5		2,127		STBG Urban or Local	

ARTERIAL STREET/ROADWAY IMPROVEMENTS: 2017-2050 (CONTINUED)

4. Planned Arterial System Preservation, TSM, and Safety Projects (Cost > $1.0 million)

FACILITY	SEGMENT	IMPROVEMENT (1)	EST. MILES	ESTIMATED TIMING (2) AND PRELIMINARY COSTS (3) 2017 to 2020	2021 to 2035	2036 to 2050	FUNDING SOURCE(S)	COMMENTS
Janesville St. (CTH CC)	Main St. to Wolfe St. (CTH MM)	Reconstruction	0.8			4,241		
Jefferson St. (CTH CC)	N. Main St. to Ash St.	Reconstruction to urban standards	0.4			1,855	Local	
John Nolen Drive	North Shore Dr. to Lakeside St.	Reconstruction	0.8		7,353		STBG Urban or Local	
N. Main St. (CTH MM)	S of CTH M to Janesville St.	Reconstruction	1.5			7,952	Local	
N. Main St. (former CTH N)	S of Limestone Pass to Cottage Grove Rd.	Reconstruction to urban standards	1.0		3,939		STBG Urban or Local	
Mid Town Rd.	CTH M (S. Pleasant View) to Meadow Rd.	Reconstruction to urban standards	1.7			9,012	STBG Urban or Local	
N. Midvale Blvd.	University Ave. to Regent St.	Reconstruction	0.5		3,939		STBG Urban or Local	
S. Midvale Blvd.	Regent St. to Nakoma Rd.	Reconstruction	2.0		15,756		STBG Urban or Local	
Milwaukee St.	E. Washington Ave. to Schenk St.	Reconstruction	1.3		5,974		Local	
Milwaukee St.	Thompson Dr. to Sprecher Rd.	Reconstruction to urban standards	1.1		4,490		STBG Urban or Local	
Milwaukee St. Extension	Wind Stone Dr. to CTH T	New 2-lane facility	1.0		3,939		Local	Excludes ROW
Mineral Point Rd.	Glenway St. to Whitney Way	Reconstruction	1.7		8,928		STBG Urban or Local	
North Shore Dr./Proudfit St.	John Nolen Dr. to W. Washington Ave.	Reconstruction	0.6			6,362	STBG Urban or Local	
W. North St. (CTH V)	N. Main St. to River Rd.	Reconstruction to urban standards	1.2		4,727		STBG Urban or Local	
Odana Rd.	Gammon Rd. to Whitney Way	Reconstruction	1.6		8,403		STBG Urban or Local	
Old Sauk Rd.	Bear Claw Way to Pioneer Rd.	Reconstruction to urban standards	1.1			5,991	STBG Urban or Local	
W. Olin Ave.	S. Park St. to Gilson St.	Reconstruction	0.3		1,379		Local	
Parmenter St.	Century Ave. to Greenbriar Rd.	Reconstruction to urban standards	0.6		2,363		Local or STP-Urban	4 Lanes
Pflaum Rd.	Monona Dr. to Stoughton Rd./US 51	Reconstruction	0.8		3,676		Local	
Pioneer Rd./Meadow Rd.	Mid Town Rd. to Old Sauk Rd.	Reconstruction to urban standards	3.2			16,964	STBG Urban or Local	
Rattman Rd.	Hoepker Rd. to W. Main St.	Reconstruction to urban standards	0.8			4,241	STBG Urban or Local	
Raymond Rd.	Muir Field Rd. to Verona Rd./US 18-151	Reconstruction	2.4			25,447	Local	

ARTERIAL STREET/ROADWAY IMPROVEMENTS: 2017-2050 (CONTINUED)

4. Planned Arterial System Preservation, TSM, and Safety Projects (Cost > $1.0 million)

FACILITY	SEGMENT	IMPROVEMENT (1)	EST. MILES	ESTIMATED TIMING (2) AND PRELIMINARY COSTS (3) 2017 to 2020	2021 to 2035	2036 to 2050	FUNDING SOURCE(S)	COMMENTS
Regent St.	Highland Ave. to Park St.	Reconstruction	1.4		7,353		STBG Urban or Local	
N. Sherman Ave.	Sherman Ave. to Commercial Ave.	Reconstruction	0.3		1,379		Local	
Siggelkow Rd.	Catalina Pkwy. to CTH AB	Reconstruction to urban standards	1.1			6,044	STBG Urban or Local	
Speedway Rd.	Mineral Point Rd. to Regent St.	Reconstruction	0.7		3,676		Local	
S. Syene Rd.	McCoy Rd. to Lacy Rd.	Reconstruction to urban standards	1.2		6,302		STBG Urban or Local	
University Ave.	Shorewood Blvd. to Campus Dr.	Reconstruction	0.7		7,353		STBG Urban or Local	
S. Whitney Way	Mineral Point Rd. to West Beltline	Reconstruction	1.0			14,137	STBG Urban or Local	
E. Wilson St.	Franklin St. to King St.	Reconstruction	0.1			707	Local	
Willams Drive	CTH B to N. Page St.	Reconstruction to urban standards	0.8			4,241	STBG Urban or Local	
Winnebago St.	Williamson St. to Atwood Ave.	Reconstruction	0.2		919		Local	
Woods Rd.	CTH PD to Mid Town Rd.	Reconstruction to urban standards	1.1			5,832	Local	
		Local Projects Total	48.7		142,864	152,963		
		Total Roadway Segments	77.6		193,769	152,963		
Interchanges/Intersections								
WIS 19	Westmount Dr. Intersection	Reconstruct w/ turn lanes, signals			1,530		State	Const. scheduled in 2022
Grand Ave. (former CTH C)	Hoepker Rd. Intersection	Reconstruct, add capacity			1,697		STBG Urban or Local	
		Interchanges/Intersections Subtotal			3,227			
Bridges								
Interstate 39/90	Milwaukee St. Bridge (B-13-0477)	Bridge deck replacement			2,555		Other structure in '17.	Const. scheduled in 2030
		Bridges Subtotal			2,555			
		Grand Total			**196,324**	**152,963**		

(1) For planning level cost estimating purposes only. Design, magnitude of improvement, and cost is subject to more detailed levels of planning and environmental study.

(2) Projects may not be able to be implemented or the schedule may be modified due to future changes in available revenue, priorities, or other factors not known at this time.

(3) Costs are year-of-expenditure assuming a 2.0% annual inflationary factor.

ARTERIAL STREET/ROADWAY IMPROVEMENTS: 2017-2050 (CONTINUED)

5. Illustrative Capacity Improvements (Pending EIS Study and/or Identified Funding)

FACILITY	SEGMENT	POTENTIAL IMPROVEMENT (1)	EST. MILES	ESTIMATED TIMING (2) AND PRELIMINARY COSTS (3) (000s) 2017 to 2020	2021 to 2035	2036 to 2050	PRIMARY FUNDING SOURCE(S)	COMMENTS
Roadway Segments								
State								
W. Beltline (US 12/14/18/151)	US 14 to Interstate 39/90	6 to 8-lane freeway w/ interchg imp.s	15.0			>1,600,000	Major Program	Planned EIS Study
US 51/Stoughton Road	Terminal Drive to Interstate 39/90/94	4 to 6-lane expressway w/ interchg imp.s	9.5		375,000		Major Program	Current EIS Study
US 51	Terminal Dr. to Interstate 39/90 E of Stgn.	Reconstruction w/ intersection imp.s and expansion to 4-lanes E of Stoughton	17.7		180,289		Majors Program	EA to be completed in '17
		State Projects Subtotal	**42.2**		**555,289**	**>1,600,000**		
Local								
CTH CV	Wheeler Rd. to Hoepker Rd.	4-lane undivided facility	1.7			12,000	STBG Urban or Local	
CTH Q	Meffert Rd. to Oncken Rd.	4-lane divided facility	2.2			23,000	STBG Urban or Local	
North Mendota Parkway (West Segment)	CTH M to US 12	4-lane divided limited access facility w/ interchanges	4.1			112,000	Unknown	Part of recommended future EIS Study; cost excludes ROW
		Local Projects Total	**8.0**			**147,000**		

(1) For planning level cost estimating purposes only. Design, magnitude of improvement, and cost is subject to more detailed levels of planning and environmental study.

(2) Scope of improvement and timing is preliminary, subject to environmental study and identification of funding source. Projects not currently part of federally recognized, fiscally constrained plan.

(3) Costs are year-of-expenditure assuming a 2.0% annual inflationary factor.

Figure A-2

Regional Priority Path Projects: 2017-2050				
		ESTIMATED TIMING AND PRELIMINARY COSTS (000s)		
Programmed Projects	**Limits**	**2017 to 2020**	**2021 to 2035**	**2036 to 2050**
NE Connector Path along Century Ave.	Pheasant Branch Trail to CTH Q	$ 368		
Zander Park Trail Expansion	Paved path and boardwalk through park in Cross Plains	829 $		
CTH M (S. Pleasant View Rd.) Corridor Path	Valley View Road to Cross Country Road	$ 4,651		
West Beltline Path Extension	Grand Canyon Drive to Junction Road	$ 7,209		
Ice Age Junction Path	CTH PD (McKee Rd) overpass ust west of High Point Road to be constructed as part of CTH PD reconstruction	$ 2,234		
Badger State Trail	CTH PD (McKee Rd) underpass to constructed as part of CTH PD reconstruction	$1,665		
Seminole Hwy Path	Dawley Park Bike Hub to Cannonball Path	$ 255		
Cannonball Path Extension	Fish Hatchery Road to Wingra Creek Path	$ 790		
Grandview Marsh Path	Pheasant Run to Creamery Road, McFarland	$ 87		
Capital City Trail Extension	Buckeye Road to I-39/90	$ 1,804		
Glacial Drumlin Trail Extension	I-39/90 to Cottage Grove	$ 2,197		
Goodman Path	Webb Ave. to WIS 30	$810		
WIS 19 Path	CTH C to Thompson Dr	$ 230		
Lower Yahara River Trail (Phase 1)	Lussier Family Heritage Center to McDaniel Park in McFarland	Ongoing		
Total		**$23,129**		

Regional Priority Path Projects: 2017- 2050				
		ESTIMATED TIMING AND PRELIMINARY COSTS (000s)		
Planned Regioinal Shared Use Paths	**Limits**	**2017 to 2020**	**2021 to 2035**	**2036 to 2050**
WIS 19 Path	Waunakee to DeForest			5,206
WIS 19 Path	DeForest to Heatherstone Dr, Sun Prairie			1,622
North Mendota Path	Pheasant Branch Conservancy to CTH Q		748	
North Mendota Path	Hwy 12 to Hwy Q		2,156	
North Mendota Path	Hwy Q to Hwy 113		1,902	
Upper Yahara River Path	Hwy 113 to Hwy 19			4,694
Bishops Bay - Waunakee Path	Bishops Bay to Waunakee		1,078	
Allen Boulevard Path	Mendota Avenue to Century Avenue		380	
Pheasant Branch West Path Paving	Century Avenue to 1.2 miles north		507	
Good Neighbor Trail	Farley Avenue to Ridge Street		2,093	
Good Neighbor Trail	Eau Claire Ave to Middleton		5,644	
Good Neighbor Trail	Middleton to Cross Plains			4,267
Good Neighbor Trail	Cross Plains to Wisconsin Heights HS, Mazomanie			11,863
US 12 Path	Rauls Road to Dunlap Hollow Road		2,536	
WIS 78 Path	Mazomanie to Sauk City			4,523
Lower Badger Mill Creek Path	McKee Rd to Hwy 14 / Good Neighbor Path			6,230
Elderberry-Junction Path	Junction Road to Lower Badger Mill Creek Path			1,109
1,000 Oaks Path	High Point to LBMC Path			1,366
West Beltline Path	Whitney Way to Southwest Path		2,536	
University Research Park I Path	Research Park Drive to West Towne		557	
Elver Connector	Raymond Road to Elver Park		507	
Southwest Path Widening	Randall Avenue to Midvale Boulevard		1,078	
CTH PD Corridor Path	CTH M (S. Pleasant View Rd.) to Nine Mound Road / Northern Lights Boulevard		469	
Military Ridge Path Paving	Old PB to Epic		1,458	
Paoli to Verona Path	Badger State Trail at Hwy A to Military Ridge Trail		2,854	
Fish Hatchery Road Path Extension	Whalen Road to Hwy M		1,078	
Oregon to Badger State Path	3,000 feet west of Alpine Pkwy to Badger State Path		1,458	
Fitchburg to Oregon Path	Lacy Road to Oregon via Syene Road and RR corridor			9,644

Regional Priority Path Projects: 2017- 2050 (continued)				
		ESTIMATED TIMING AND PRELIMINARY COSTS (000s)		
Planned Regioinal Shared Use Paths	**Limits**	**2017 to 2020**	**2021 to 2035**	**2036 to 2050**
Campus Drive Path	Easterday Lane to Babcock Drive		613	
Lower Yahara River Trail (Phase 2)	McFarland to Stoughton		5,010	
US 12 Path	Milpond Rd to Vilas Rd			9,303
Capital City Path Gap Connection	Cottage Grove Road to Buckeye Road		571	
Blooming Grove Drumlin Path	Owl Creek to I-94			12,887
Cottage Grove to Sun Prairie Path and Route	Path from Hwy BB to Town Hall Rd, on-street along Town Hall Rd, and path along Hwy N from Bailey Rd to Sun Prairie HS		1,268	
Cambridge to Glacial Drumlin Path	Cambridge to Glacial Drumlin Path		3,361	
Commercial Path	Thompson Rd. to I-39		571	
Interstate Path	SP rail corridor to Milwaukee Street underpass			4,182
Pipeline Path	Commercial to O'Keeffe			2,134
Hiestand Path	Olbrich to East Towne		7,927	
Goodman Path	WIS 30 to East Towne		4,883	
Goodman Path	East Towne to US 151 Path / West Sun Prairie		4,946	
West Sun Prairie Path	Hazelnut Trail to WIS 19		317	
Milwaukee Road Path	Burke Road / Good Neighbor Path to Sun Prairie			2,134
Milwaukee Road Path	Sun Prairie to Marshall			9,132
Packers Path	Yahara River to Dane County Airport		1,395	
Token Creek Path	Dane County Airport to WIS 19		10,273	
North Street Corridor Path, DeForest	Main Street to WIS 51		1,332	
Lake Road Corridor Path, DeForest	WIS 19 to Vinburn Rd			2,987
Hartmeyer Path	Aberg Avenue to Commercial Avenue		254	
Sherman Flyer Path	Johnson to Aberg (Sheridan / Steensland)		1,078	
Sherman Flyer Path	Aberg Ave to Troy Drive			4,097
Sherman Flyer Path	Troy Drive to Waunakee			2,134
Capital City Path Widening	Lakeside Street to Starkweather Path		7,166	
James Madison Path	Lake Street to James Madison Park			13,826
Howard Temin Lakeshore Path Paving	Elm Drive to Memorial Union			427
Total			**80,003**	**113,764**

Recommendations and Supporting Actions

Land Use and Transportation Integration

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Adopt local land use plans and policies that support RTP goals and policies.		
A	Update land use ordinances, street design, and parking standards to remove barriers to mixed-use, pedestrian-friendly development, where appropriate.	Ongoing	Local governments
B	Prepare detailed neighborhood development plans in areas slated for growth prior to development in order to ensure good street connectivity, adequate bicycle accommodations, and efficient transit routes (where appropriate).	Ongoing	Local governments
C	Require or provide incentives for including pedestrian, bicycle, and transit facilities (where appropriate) in (re)developments.	Ongoing	Local governments
D	Plan, zone for, and encourage transit-supportive development in planned transit corridors.	Ongoing	Local governments
2	Develop urban areas with a mix of housing types and land uses to provide walkable, affordable neighborhoods.		
A	Plan for mixed-use centers of varying scales and types to provide housing in proximity to a mix of uses.	Ongoing	Local governments
B	Develop new employment centers and government/institutional developments in mixed-use settings, where compatible, to provide for housing near jobs and schools.	Ongoing	Local governments
C	Support the revitalization of downtown areas and walkable neighborhoods with infrastructure investments and incentives.	Ongoing	Local governments
D	Promote new development in multi-modal mobility corridors to maximize the efficiency of transportation system and the accessibility of jobs and services.	Ongoing	Local governments

Streets/Roadways

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Preserve and maintain the region's street and highway system in a manner that minimizes life cycle cost, maintains safety, and minimizes driver costs while reducing their impact on the environment.		
A	Monitor regional roadway system pavement and bridge condition and coordinate with WisDOT to establish performance targets.	1-5 years	MPO, WisDOT
B	Develop and implement asset management plans to facilitate cost-effective decision-making concerning the maintenance and rehabilitation of roadways, bridges, and associated infrastructure.	Ongoing	WisDOT, Dane County, local governments
C	Provide for ongoing maintenance activities in major state and local arterial corridors planned for future potential expansion until capacity is needed and major project funding can be secured.	Ongoing	WisDOT, Dane County, local governments
D	Continue enforcement of truck weight regulations to reduce premature deterioration of roadways and bridges.	Ongoing	WisDOT
E	Support additional research and demonstration projects, including use of emerging technologies, to provide safe roadways in the winter while minimizing the use of road salt.	1-5 years	WisDOT, Dane County, local governments
2	Build a well-connected network of regional roadways to accommodate future growth and avoid the need for overly wide streets and intersections that create barriers for pedestrians and bicyclists.		
A	Conduct detailed planning for new collector streets and utilize official mapping, right-of-way dedications, and other methods to preserve existing and planned regional roadway corridors for potential expansion.	Ongoing	Local governments

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	Incorporate complete streets and green streets concepts for regional and local roadways.		
A	Utilize evaluation criteria and scoring guidelines for selecting MPO funded projects that encourage the inclusion of complete and green streets elements.	Ongoing	MPO
B	Adopt and implement a formal complete streets policy.	1-5 years	WisDOT, Dane County, Local governments
4	Expand regional roadway system capacity to address critical bottlenecks and accommodate future planned growth consistent with RTP goals and policies.		
A	Continue or initiate detailed planning, design, and construction of state and local arterial capacity roadway, bridge, and interchange projects shown in Figure 5-2 and listed in Figure A-1 as needed with consideration given to project phasing where appropriate.	Ongoing	WisDOT, Dane County, Local governments
B	Complete study of the Beltline/Interstate interchange. Upon completion of accepted EIS, advance recommended alternative, with consideration given to phasing, compatibility of the design with potential Beltline/Stoughton Road interchange improvements, and planned US 12/18 freeway conversion east to CTH AB.	1-10 years	WisDOT
C	Complete major corridor studies of the Beltline and Stoughton Road/US 51. Upon completion of accepted EISs, seek enumeration as Majors projects and advance recommended alternatives using a phased approach. Continue to implement short-term TSM, safety, and multi-modal improvements in the corridors in the interim until Majors program funding is secured.	1-10 years	WisDOT
D	Complete environmental assessment and refine the design for the preferred alternative for the US 51 (McFarland to Stoughton) corridor, which includes reconstruction of most of the roadway, intersection improvements, and expansion to 4 lanes between WIS 138 and CTH B. Upon completion, seek enumeration as Majors project or alternative funding and advance project using a phased approach. Implement safety and TSM improvements and maintenance work in corridor in the interim if Majors program or other funding is not secured.	1-10 years	WisDOT
E	Initiate major study of the WIS 19/WIS 113/CTH M corridor to identify the long term solution to existing and future congestion and safety issues in the east-west corridor north of Lake Mendota. Officially map the corridor and initiate detailed planning of the recommended alternative, including appropriate phasing and funding strategies. Continue in the meantime to implement TSM, safety, and multi-modal improvements.	1-10 years	WisDOT, Dane County, MPO
F	Identify the appropriate limits and initiate study of the I-39/90/94 corridor north of the Beltline to address safety, operations, and congestion issues and in the meantime implement TSM and safety improvements.	1-10 years	WisDOT, MPO
5	Address safety needs on the regional roadway system through a comprehensive "3-E" approach that includes implementation of cost-effective engineering counter measures (i.e., roadway reconfiguration, new or modified traffic control devices, etc.), education, and enforcement.		
A	Implement WisDOT's 2014-2016 Wisconsin Strategic Highway Safety Plan (SHSP) and future updates to the plan.	Ongoing	WisDOT, Dane County, local governments, state agencies, law enforcement agencies, private organizations
B	Undertake planning process to identify regional roadway corridors and intersections with the highest crash rates and conduct further detailed study of these locations to identify countermeasures and prioritize projects for federal and state Highway Safety Improvement program funding.	1-5 years	MPO, Dane County, local governments

Recommendations and Supporting Actions		Timeframe	Implementing Party
C	Continue efforts to implement short-term safety-related and TSM improvement recommendations from preservation/safety studies in state highway corridors, including US 14 (West), WIS 19, and WIS 138.	Ongoing	WisDOT
D	Develop and implement access management plans and standards for existing and future arterial roadways as development and street reconstruction occur.	Ongoing	WisDOT, Dane County, Local governments
E	Continue to implement cost-effective changes to traffic signals and signs that have been found to reduce crashes (e.g., use of light emitting diode (LED) lighting, overhead street signs on arterials, etc.).	Ongoing	WisDOT, Local public works/traffic engineering agencies
F	Officially map the US 12 (Parmenter St. to WIS 19 West), US 12/18 (Interstate to CTH N), and US 18/151 corridors for potential future freeway conversion based on recommended study alternatives. Continue to implement interim access management improvements, with future conversion dependent upon ongoing needs assessment and available funding.	Ongoing	WisDOT
G	Continue to expand state and local safety education efforts, including neighborhood-based initiatives.	Ongoing	WisDOT, local governments, non-profit organizations
H	Continue to support and expand local traffic enforcement activities such as use of local traffic teams and undertaking special enforcement initiatives.	Ongoing	Dane County and local law enforcement agencies
6	Address security needs related to the regional roadway system.		
A	Update the vulnerability assessment of critical transportation infrastructure in the state as part of development of the State Highway Investment Plan. Monitor identified facilities and make improvements as needed.	Ongoing	WisDOT
B	Complete current update and update as necessary Dane County Hazard Mitigation Plan to reduce risk of disruptions to the regional roadway system due to severe weather conditions, flooding, terrorism, hazardous material spills, civil disorder, climate change, and other events.	1-5 years	Dane County, Local governments
C	Initiate study to identify transportation facilities that are susceptible to flooding, identify alternate routes when flooding occurs, and identify improvements to make the facilities more resilient to flooding.	1-5 years	MPO, Dane County, Local governments
D	Update the county's Emergency Evacuation Plan, as necessary.	1-5 years	Dane County
7	Address roadway naming inconsistency along corridors.		
A	Initiate a study of regional roadway naming conventions to simplify wayfinding in the region.	1-5 years	MPO

Public Transit

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Implement a Bus Rapid Transit System.		
A	Complete an alternatives analysis and project planning, leading to an initial BRT Project.	1-5 years	City of Madison and other Local Governments, Metro, MPO
B	Expand the BRT network to fulfill the BRT Vision in the Madison area.	5-15+ years	Cities of Madison and Fitchburg, Metro, MPO
C	Plan for the expansion of BRT into other corridors, including Middleton, southwest Madison, Fitchburg, southeast Madison, and Sun Prairie.	15+ years	Metro, MPO, Local Governments
D	Expand the use of transit priority treatments, focusing on the BRT corridors.	Ongoing	Metro, MPO, Local Governments

Recommendations and Supporting Actions		Timeframe	Implementing Party
2	**Improve the local bus network.**		
A	Continue to optimize the local bus network to maximize its utility with available resources.	Ongoing	Metro, MPO
B	Measure and monitor the effects of service changes on low-income and minority populations.	Ongoing	Metro, MPO
C	Improve integration with bordering transit systems in Monona and Sun Prairie.	Ongoing	Metro, MPO
D	Reduce travel times and simplify service.	Ongoing	Metro
E	Expand and enhance the network of frequent local service in central Madison.	5-15 years	Metro
F	Make changes to local routes when BRT is opened in order to reduce duplication and enhance connections.	5-15+ years	Metro, MPO
G	Improve and expand data collection and analysis to support service planning.	Ongoing	Metro, MPO
3	**Add service in developing neighborhoods.**		
A	As developing neighborhoods are built out, enhance limited-service routes so that they provide regular service throughout the day.	Ongoing	Metro, Local governments
B	Add new all-day service in unserved peripheral neighborhoods and suburban communities such as Sun Prairie, McFarland, and Verona.	5-15+ years	Metro, Local governments
4	**Enhance transit stops with improved pedestrian/bicycle access and amenities.**		
A	Coordinate with municipalities, businesses, and neighborhood associations to plan and provide funding for stop improvements.	Ongoing	Metro, MPO, Local governments
B	Utilize TID funding and other alternative financing mechanisms to fund stop improvements.	Ongoing	Local governments
C	Plan and reserve space for transit stops/stations as part of new developments where appropriate.	Ongoing	Local governments
5	**Utilize alternative service delivery models to serve low-demand areas.**		
A	Analyze bus route productivity and identify service with low use and high travel times that may better serve neighborhoods with alternative transit models.	1-5 years	Metro, MPO
B	Develop peripheral routes with small vehicles that can deviate from their route with the goal of providing service in low density areas at a lower cost and reducing multiple-transfer trips.	1-5 years	Metro, MPO, Private Providers, Non-Profits
C	Investigate using transportation network companies and shared-ride taxi service to connect to transfer points, BRT, and regional express service.	1-5 years	Metro, MPO, Private Providers, Non-Profits
D	Plan for the use of driverless shuttles in low-density transit markets and niche areas like business parks and campuses.	1-5 years	Madison Traffic Eng, UW, Metro, MPO
6	**Maintain, expand, and enhance bus rolling stock and supporting facilities.**		
A	Renovate and remodel the existing Metro maintenance/bus storage facility and address maintenance issues.	1-5 years	Metro
B	Build a new satellite bus facility on Nakoosa Trail to accommodate a larger fleet, including articulated buses and electric buses.	1-5 years	Metro
C	Replace buses on a regular cycle to ensure reliability and comfort.	Ongoing	Metro
D	Expand the use of alternative fuel vehicles with a goal of having a fully emission-free electric fleet by 2050.	Ongoing	Metro
E	Introduce articulated 60-foot buses to the fleet to reduce overcrowding and accommodate BRT.	5-15 years	Metro
7	**Implement a regional express bus network.**		
A	Expand and optimize the existing regional express service to Middleton and Verona.	5+ years	Metro, Local governments, MPO
B	Operate new routes primarily during the morning and afternoon peak periods to suburban Madison communities.	5-15 years	Metro, Local governments

Recommendations and Supporting Actions		Timeframe	Implementing Party
C	Optimize the regional express transit service to provide service from Madison to suburban job centers as well as from residential areas to central Madison.	5-15 years	Metro, MPO, local governments
D	Provide limited stop service within City of Madison to provide fast service within Madison and connections to BRT and local service.	5-15 years	Metro, Local governments
8	Expand park-and-ride facilities in conjunction with BRT and express services.		
A	Investigate opportunities to share space at shopping centers, churches, and other private facilities as well as public facilities such as parks, where appropriate. See Fig. 5-5, Planned transit System.	1-5 years	Metro, MPO, Local governments
B	Explore partnerships with local communities and agencies to maintain park-and-ride facilities.	1-5 years	Metro, Local governments
9	Implement a regional transit entity with stable funding and representative governance.		
A	Ensure that funding for transit remains equitable and that decisions are made fairly, with communities represented appropriately.	Ongoing	Metro, Local governments
B	Explore alternatives to supplement or replace the property tax for local public funding, including a vehicle registration fee and sales tax (if state enabling legislation passed).	1-5+ years	Local governments
C	Implement a new regional transit authority or district with the mission of providing regional transit service if state enabling legislation is passed.	1-5+ years	Metro, Local governments

Bicycles

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Expand the bikeway network with new shared-use paths and on-street facilities.		
A	Construct new off-street shared-use paths to complete the bikeway network envisioned in the Bicycle Transportation Plan.	Ongoing	Dane County, Local governments
B	Construct new shared-use paths in developing neighborhoods so that facilities are available as soon as new residents move in.	Ongoing	Dane County, Local governments
C	Retrofit existing corridors like railroad and utility rights-of-way with bicycle facilities as appropriate.	Ongoing	Local governments
D	Provide enhanced or premium bicycle facilities in key urban arterial corridors within right-of-way where feasible.	Ongoing	Local governments
E	Expand the use of bicycle boulevards, bicycle priority streets, and priority treatments at intersections.	Ongoing	Local governments
F	Prepare and implement local bicycle plans.	Ongoing	Local governments
G	Include paved shoulders of at least 4 feet in width on rural highways where appropriate and economically feasible.	Ongoing	WisDOT, Dane County
2	Maintain and modernize existing bicycle facilities.		
A	Repave and repair bicycle facilities with similar standards as collector streets.	Ongoing	WisDOT, Dane County, local governments
B	Include bicycle facilities on all new bridges and highway crossings.	Ongoing	WisDOT, Dane County, local governments
C	Use innovative bike facility designs that meet or exceed state and national guidelines.	Ongoing	Local governments
D	Develop and implement local policies and practices to clear snow, ice, and debris from bike facilities.	Ongoing	Dane County, Local governments
3	Eliminate bicycling barriers and hazards in the bikeway network.		
A	Close regional bikeway network gaps and address barriers (see Figure 5-9).	Ongoing	Dane County, Local governments
B	Evaluate intersections with a history of safety concerns or complaints, and plan and implement improvements.	Ongoing	WisDOT, Dane County, local governments

Recommendations and Supporting Actions		Timeframe	Implementing Party
C	Complete the local street network where barriers prevent direct travel.	Ongoing	Local governments
D	Ameliorate conflicts between bikes and buses, delivery trucks, and pedestrians.	Ongoing	Local governments
4	Provide adequate bicycle parking.		
A	Require bicycle parking as a condition of new development.	Ongoing	Local governments
B	Provide public bicycle parking in business districts, on campuses, and at high-use transit stations.	Ongoing	Local governments
5	Improve bicyclist safety through a "3E" approach .		
A	Conduct studies of intersections and other areas with high crash rates or documented safety issues to identify appropriate countermeasures.	Ongoing	Local governments, MPO
B	Update 1991 City of Madison study of vehicular crashes involving pedestrians and bicyclists, expanding it to the metro area, to obtain up-to-date information on common patterns for crashes. Utilize the information in crash prevention efforts.	1-5 years	MPO, City of Madison Traffic Engineering
6	Continue bike share, education, and bicyclist supportive policies.		
A	Continue supportive policies like producing bicycle maps and accommodating bicycle-themed events.	Ongoing	MPO, Local governments, NGOs
B	Implement wayfinding system for bicyclists using the recently developed Bicycle Wayfinding Design Guidelines for Dane County.	Ongoing	Dane County, Local governments
C	Expand the bike share program, working with the provider, by expanding the coverage and increasing the density of stations.	Ongoing	BCycle, Local governments
D	Support and expand education and encouragement programs that promote safety and encourage all residents to bicycle for commuting and other trips.	Ongoing	MPO, Local governments

Pedestrians

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Provide sidewalks and appropriate pedestrian amenities in developing neighborhoods.		
A	Require sidewalks on both sides of all streets in new urban developments.	Ongoing	Local governments
B	Adopt land use ordinances to ensure new developments provide for adequate pedestrian circulation and are integrated with adjacent land uses.	Ongoing	Local governments
C	Connect bordering, developing neighborhoods with sidewalks and shared-use paths.	Ongoing	Local governments
D	Prepare and implement local pedestrian plans.	Ongoing	Local governments
2	Retrofit regional streets with modern, safe pedestrian accommodations .		
A	Prioritize the addition of missing sidewalks on arterial and collector streets with higher demand for walking (See Fig. 5-11).	Ongoing	WisDOT, Local governments
B	Identify pedestrian needs and gaps, as well as safety problems, and implement solutions.	Ongoing	WisDOT, Local governments
C	Reduce cost share required of property owners to retrofit in sidewalks in existing neighborhoods.	Ongoing	Local governments
D	Prepare and implement ADA compliance plans to retrofit non-conforming facilities to ADA standards.	Ongoing	Local governments
E	Identify and install accessible pedestrian signal systems and other ADA accessibility treatments where necessary.	Ongoing	WisDOT, Local governments
F	Provide for a more comfortable pedestrian experience with wider sidewalks and appropriate separation on high-volume regional roads with pedestrian traffic.	Ongoing	WisDOT, Local governments

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	Improve safety and usability for pedestrians at intersections and crossings.		
A	Evaluate pedestrian improvements at major street crossings and implement as opportunities are available. See Fig. 5-11 identifying many of these high conflict locations.	Ongoing	Local governments, MPO
B	As intersections are designed and reconstructed, consider pedestrian safety improvements.	Ongoing	WisDOT, Local Governments
C	Use pedestrian design tools to improve crossings such as enhanced crosswalks, refuge islands, and rapid flashing beacons. See Pedestrian Facilities Toolbox in Appendix F.	Ongoing	WisDOT, Local Governments
D	Identify and prioritize new grade-separated crossings where streets and shared-use paths with substantial pedestrian traffic intersect with highways and other barriers.	Ongoing	WisDOT, Local Governments
4	Maintain sidewalks and pedestrian facilities for year-round use.		
A	Provide and enforce snow removal policies, particularly around intersections and bus stops.	Ongoing	Local Governments
B	Implement program to identify and repair broken and substandard sidewalks.	1-5 years	Local Governments
5	Design new streets and retrofit existing streets to reduce speeding.		
A	Ensure that local street standards do not require unnecessarily wide streets.	Ongoing	Local Governments
B	Retrofit existing overly wide streets to reallocate space for other uses as part of reconstruction.	Ongoing	WisDOT, Dane County, Local Governments
C	Incorporate traffic calming features into new local streets where appropriate.	Ongoing	Dane County, Local Governments
D	Implement traffic management programs to address speeding and cut-through traffic problems on existing streets.	Ongoing	Dane County, Local Governments

Inter-Regional Travel

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Build an inter-city bus terminal.		
A	Construct a new high-quality inter-city bus terminal in central Madison.	5-15 years	City of Madison
B	Ensure the new facility has convenient access to downtown Madison and the UW.	5-15 years	City of Madison, UW
C	Ensure that passengers can conveniently transfer to BRT and local buses.	5-15 years	City of Madison, Metro
2	Support new and improved inter-city bus service.		
A	Improve service frequency to Minneapolis / St Paul and Appleton / Green Bay.	1-5 years	WisDOT, Private Providers
B	Improve connections to Amtrak services.	1-5 years	WisDOT, Private Providers
C	Provide direct service to Davenport, Des Moines, Omaha, and other cities to the west.	1-5 years	WisDOT, Private Providers
3	Maintain and preserve the rail network for future passenger rail service.		
A	Identify inter-city passenger rail routes to Milwaukee, Chicago, and Minneapolis / St Paul.	15+ years	WisDOT
B	Identify station locations for passenger rail service.	15+ years	Local Governments, Metro MPO, Dane County, WisDOT

Specialized Transportation

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Expand the coverage of accessible fixed-route bus and paratransit service and address other identified service related needs.		
A	Implement the recommendations in the Transit Development Plan and address needs identified in the Dane County Coordinated Public Transit - Human Services Transportation Plan	Ongoing	Metro, MPO
B	Explore opportunities to expand paratransit and accessible shared-ride taxi service in urban areas beyond the fixed-route bus service area	5-15 years	Metro, MPO, Dane County
2	Work collaboratively with private taxi operators to ensure accessible taxi service is available and costs for the service are shared equitably.		
A	Work collaboratively with private taxi operators to ensure accessible taxi service is available and costs for the service are shared equitably	Ongoing	MPO, City of Madison, Private Taxi Operators, Non Profits
3	Continue and expand specialized work-based transportation for low-income people.		
A	Work with the non-profit organizations to ensure funding remains available for people to get to work who don't have traditional options.	Ongoing	MPO, City of Madison, non-profit organizations
B	Continue to maximize efficiency by optimizing vehicles and timetables.	Ongoing	Non-profit organizations
4	Utilize emerging technologies to lower operating costs and expand travel options.		
A	Modify policies as needed to ensure that autonomous vehicles can adequately serve seniors and people with disabilities.	5-15 years	MPO, City of Madison, WisDOT
5	Improve interagency coordination of the various specialized transit services and private services.		
A	Plan for the advent of Family Care in Dane County, including for IRIS (self-directed services) members to prevent cost-shifting to Metro Transit.	Ongoing	MPO, City of Madison, Metro Transit
B	Improve coordination of medical trips, including inter- and intra-community trips and from surrounding counties.	Ongoing	City of Madison, WisDOT

Travel Demand Management (TDM)

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Expand the regional network of park-and-ride lots to encourage carpooling, transit use, and bicycling.		
A	Explore partnerships with local communities and agencies to develop park-and-ride facilities.	1-5 years	WisDOT, Dane County, Local governments
2	Expand the state vanpool program and support development of additional vanpool programs.		
A	Support expansion of WisDOA vanpool program and development of additional vanpool programs.	5-15 years	WisDOA, WisDOT, Local Governments, Non-Profits, Private Providers
3	Continue to encourage and provide support to large employers, institutions, and municipalities to develop and promote strategies to reduce single occupant motor vehicle trips.		
A	Support establishment of Transportation Management Associations in major employment centers.	1-5 years	MPO, Local governments
B	Encourage and provide assistance to local communities interested in requiring TDM plans as a condition of approval for large commercial developments, with specific criteria and standards for such plans.	1-5 years	Local governments, MPO
C	Continue to encourage telecommuting and alternative work schedules.	Ongoing	Local governments, MPO

Recommendations and Supporting Actions		Timeframe	Implementing Party
4	Provide financial incentives for people to use alternative transportation and increase funding for marketing programs.		
A	Continue efforts to expand employer participation in alternative transportation incentive programs such as Metro's Commute Card program, parking cash-out programs, or other financial reward programs.	Ongoing	MPO, Metro, Local Governments
B	Increase funding for support services such as Guaranteed Ride Home, occasional parking programs, and marketing of the programs.	1-5 years	MPO, Dane County, Local Governments
C	Increase funding for advertising and marketing programs, including individualized marketing programs such as Love to Ride and SmartTrips.	1-5 years	MPO, Dane County, WisDOT, Metro
5	Support transportation options at schools through Safe Routes to School programs.		
A	Secure sustainable funding for a regional Safe Routes to School program, utilizing resources such as mini-grants, CIP funding, local operating budget funding, private funding, and/or federal funding.	1-5 years	MPO, Non-Profits, School Districts, Local Governments
B	Develop and implement a regional Safe Routes to School program.	1-5 years	MPO, Non-Profits, School Districts, Local Governments

Transportation System Management (TSM) and Operations and ITS

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Implement and periodically update the adopted Congestion Management Process.		
A	Continue and improve monitoring of system performance, including post-construction project impact evaluation, utilizing the methodology outlined in the plan.	Ongoing	MPO, Dane County, Local goverments, WisDOT
B	Identify, prioritize, and implement corridor and intersection TSM projects to improve traffic and transit operations and safety on the arterial roadway system.	Ongoing	MPO, WisDOT, Dane County, Local Governments
C	Investigate the feasibility, benefits, and costs of an expanded incident detection and response program for additional state roadways (e.g., Verona Road) and selected local arterials.	1-5 years	WisDOT, Dane County, Local Goverments, MPO
D	Update the CMP to account for new federal rules, data sources, and MPO resources.	1-5 years	MPO
2	Implement access management plans and standards for existing and planned future arterial roadways as development and street (re)construction occur.		
A	Initiate access management plans on congested corridors as development and street reconstruction occur	1-5 years	MPO
B	Develop a regional access management plan that identifies standards for future arterials roadways, best practices, and safety considerations	1-5 years	MPO
3	Modernize the multimodal transportation network using technology.		
A	Include as part of new urban roadway projects infrastructure for connected and autonomous technologies, where appropriate.	Ongoing	WisDOT, Dane County, Local governments
B	Replace obsolete traffic signal controllers with "smart" controllers when replacing traffic signals or constructing new signalized intersections.	Ongoing	WisDOT, Local governments
C	Implement adopted process to identify and integrate ITS infrastructure into planning and design of major state roadway projects.	Ongoing	WisDOT

Recommendations and Supporting Actions		Timeframe	Implementing Party
4	Implement and periodically update the Regional Intelligent Transportation Systems Strategic Plan.		
A	Continue planning efforts to advance the recommendations listed in the ITS plan .	Ongoing	WisDOT, Dane County, Metro, Local governments
B	Continue to engage with the ITS Plan Implementation Subcommittee to facilitate cooperation and coordination among state and local agencies.	Ongoing	MPO
C	Continue efforts to provide comprehensive real-time traveler information to people and businesses.	Ongoing	WisDOT, City of Madison
D	Implement a smart card payment system that can be expanded to include a common fare media for other civic uses, as well as an open payment system that accepts fares using personal electronic devices.	1-5 years	Metro

Freight, Air, and Rail

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Maintain and promote new industrial uses along freight corridors.		
A	Work with stakeholders to determine significant transportation issues that negatively impact freight focused businesses within the region.	1-5 years	MPO, WisDOT
B	Work to cluster similar industrial uses to promote efficiency of the freight network.	Ongoing	Local governments
2	Maintain and expand infrastructure on the multimodal freight network, prioritizing projects that improve safety and efficiency, and minimize lifetime costs.		
A	Investigate and implement vehicle-to-infrastructure technologies to increase safety along freight corridors.	1-5 years	WisDOT, Dane County, Local governments
B	Investigate and implement vehicle-to-infrastructure technologies that reduce delay for passenger and freight vehicles in freight corridors.	1-5 years	WisDOT, Dane County, Local governments
C	Investigate ways in which new technologies, such as 3D printing, may impact the demand for future transportation facilities when planning improvements to the network.	1-5 years	WisDOT, Dane County, Local governments
D	Continue enforcement of truck weight regulations to reduce premature deterioration of roadways and bridges.	Ongoing	WisDOT
3	Increase focus on freight planning for regional and local transportation facilities.		
A	Continue to incorporate freight considerations into corridor and planning studies.	Ongoing	WisDOT, Dane County, Local governments
B	Plan for and implement recommendations from the Wisconsin State Freight Plan.	Ongoing	WisDOT, Local governments
C	Ensure local and regional freight-centric projects are listed in Wisconsin State Freight Plan to maintain eligibility for enhanced federal matching funds.	1-5 years	WisDOT, Dane County, MPO, Local governments
D	Consider first and last mile(s) implications for freight when approving site plans for freight focused facilities.	Ongoing	Local governments
4	Maintain the availability of rail facilities for current and future uses.		
A	Preserve rail corridors for freight uses, acquiring excess land when available to ensure availability for future transportation uses.	Ongoing	WisDOT, Rail Transit Commissions
B	Replace ties, ballast, and jointed rail with modern materials to accommodate heavier loads and higher speeds.	Ongoing	WisDOT, Rail Transit Commissions, Private Operators
C	Plan for improvements to accommodate high speed, high volume passenger service on routes to Milwaukee, Chicago, and St Paul, such as positive train control, double-tracking, and electrification.	15+ years	WisDOT

Recommendations and Supporting Actions		Timeframe	Implementing Party
5	Mitigate conflicts between rail and other uses		
A	Identify high-conflict rail crossings and mitigate conflicts, when possible.	Ongoing	WisDOT, Dane County, Local Governments
B	Continue to implement quite zones in residential neighborhoods within urbanized areas.	Ongoing	Local Governments
C	Work with rail companies to grade-separate high-use rail crossings.	Ongoing	WisDOT, Dane County, Local Governments
6	Ensure compatibility of uses near airports.		
A	Ensure land use plans within airport influence areas are compatible with existing and planned airport plans.	Ongoing	Local Governments
B	Ensure Airport Master Plans consider existing and future uses identified in community comprehensive plans.	Ongoing	Dane County
C	Continue to implement the Airport Master Plan.	Ongoing	Dane County
7	Improve airport facilities to enhance usability and convenience for passenger traffic.		
A	Improve connections to the airport for all modes of transportation, including increasing frequency and speed of transit connections between Dane County Airport, downtown Madison, and the UW campus.	Ongoing	WisDOT, Dane County, Metro, Local Governments
B	Consider how future transportation technologies may influence the way that passengers travel to and from airports when building new parking lots and passenger pickup/drop off facilities.	1-5 years	MPO, Dane County, Local governments
8	Improve airport facilities freight accommodations and connections		
A	Survey businesses to determine if Dane County Airport is adequately serving their needs and determine what could be done to improve service.	1-5 years	Dane County
B	Contact freight shippers operating out of Dane County Airport to determine if needs are being met with current facilities and identify improvements that must be made for future success.	1-5 years	MPO, Dane County, Local governments
C	Survey local businesses to determine if air freight needs are being met and what types of improvements would improve business viability.	1-5 years	MPO, Dane County, Local governments

Parking

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	Use parking management strategies to reduce congestion within downtown areas and major activity centers.		
A	Develop and implement a downtown Madison parking management plan.	1-5 years	City of Madison
B	Implement technologies and associated policies, such as demand responsive pricing, that increase access and convenience to parking, and reduce vehicle idling and circling to find parking.	5-15 years	Local governments
C	Encourage ridesharing by developing and implementing policies that reduce parking rates and/or provide preferential parking spots to carpools and vanpools.	1-5 years	Local governments
2	Modify parking requirements to encourage multi-modalism, using a more market-based approach while addressing potential spillover impacts.		
A	Review minimum parking requirements to ensure an appropriate balance between parking needs and continuity of the built environment.	1-5 years	Local governments
B	Allow deviation from parking minimums, particularly in dense urban areas, to accommodate innovative project designs that maximize access to alternative modes of transportation and incorporate TDM strategies.	1-5 years	Local governments

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	Ensure flexibility of parking facilities to accommodate future technologies.		
A	Ensure that streets are designed with future flexibility in mind and that parking policies allow for conversion to loading zones if/when autonomous vehicle technologies are implemented.	1-5 years	Local governments
B	Ensure new parking structures are designed to allow for conversion to other uses if/when autonomous vehicle technologies are implemented.	5-15 years	Local governments

APPENDIX B: ENVIRONMENTAL JUSTICE ANALYSIS

Introduction

As part of MATPB's continuing efforts to comply with Title VI and address environmental justice, an analysis was conducted to evaluate the impacts of the Regional Transportation Plan (RTP) 2050 on minority populations, low-income households, and those households without access to an automobile. Special efforts were also made to ensure that minority and low-income populations were provided with an opportunity to participate in the planning process. These are documented in the MATPB's Public Participation Plan.

Title VI of the 1964 Civil Rights Act (42 U.S.C. 2000d-1) states that "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." To further amplify Title VI, President Clinton issued Executive Order 12898 in 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. The purpose of the order is to make achieving environmental justice part of each Federal agency's mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of government programs, policies, and investments, such as transportation facilities, on minority and low-income populations. The goal is to ensure that the benefits and burdens of government actions and investments are fairly distributed, and that minority and low-income populations are not disproportionately affected in an adverse way. In 1997, the U.S. Department of Transportation (USDOT) issued an order to summarize and expand upon the requirements of Executive Order 12898 on Environmental Justice. The Order generally describes the process for incorporating environmental justice principles into all DOT existing programs, policies, and activities.

Title VI, Executive Order 12898, the USDOT order, and other USDOT guidance do not contain specific requirements in terms of evaluating the impacts of transportation plans and programs on environmental justice populations. For this RTP, a qualitative analysis has been conducted of the impacts of proposed transportation projects on areas with high concentrations of these populations. MATPB will continue efforts to develop analysis tools to better quantitatively assess the benefits and impacts of recommended transportation projects on EJ populations as part of future planning efforts.

Environmental Justice Population and Areas of Concentration within the Madison Metropolitan Planning Area

The 2010 minority population within the current Madison Area Metropolitan Planning Area was about 72,400 or around 16.6% of the total population of 435,400. This represented an increase of over 26,500 or 58% since 2000. African Americans accounted for 5.7% of the planning area population and Asians accounted for 5.2%. The 2010 Hispanic or Latino population was over 27,200 or around 6.3% of the planning area population. This represented an increase of around 13,500 or over 100% since 2000.

Figure B-1 shows the number and percentage of minority and Hispanic populations in the cities and villages within the planning area and in the Town of Madison in 2010 and the change from 2000. The larger cities (Madison, Fitchburg, Sun Prairie, Middleton) and Town of Madison have the highest percentages of minority and Hispanic populations, but most cities and villages have a minority population of close to 5% or more. The Hispanic population is more concentrated in the cities of Madison and Fitchburg, along with Town of Madison.

Figures B-2 and B-3 highlight areas within communities where there is a concentration of minority and Hispanic populations. These areas include the South side (Fish Hatchery Road, Badger Road, Southdale area in Town of Madison), Southwest side (Allied Drive, Park Ridge/Prairie Hills neighborhoods), Wexford Ridge neighborhood, Sheboygan Avenue, Northport Drive, and Eagle Heights on the UW campus. Figures B-4 and B-5 highlight areas where there has been an increase in these populations. The minority population increased the most in the east UW campus area where housing for students has been expanded, Fish

Figure B-1

Minority Populations within the Madison Metropolitan Area

	2000				2010				Change	
	Minority Population		Hispanic Population		Minority Population		Hispanic Population		Minority Population	Hispanic Population
Municipality	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Difference	Difference
Madison, City	33,365	16.0%	8,512	4.1%	49,179	21.1%	15,948	6.8%	5.1%	2.7%
Cottage Grove, Village	174	4.3%	73	1.8%	490	7.9%	185	3.0%	3.6%	1.2%
Cross Plains, Village	37	1.2%	13	0.4%	103	2.9%	57	1.6%	1.7%	1.2%
DeForest, Village	343	4.7%	161	2.2%	602	6.7%	325	3.6%	2.1%	1.5%
Fitchburg, City	3,652	17.8%	1,329	6.5%	7,030	27.8%	4,341	17.2%	10.0%	10.7%
Maple Bluff, Village	39	2.9%	9	0.7%	54	4.1%	19	1.4%	1.2%	0.8%
McFarland, Village	179	2.8%	73	1.1%	435	5.6%	176	2.3%	2.8%	1.1%
Middleton, City	1,249	7.9%	444	2.8%	2,251	12.9%	984	5.6%	5.0%	2.8%
Monona, City	505	6.3%	256	3.2%	563	7.5%	232	3.1%	1.2%	-0.1%
Oregon, Village	172	2.3%	50	0.7%	425	4.6%	204	2.2%	2.3%	1.5%
Shorewood Hills, Village	139	8.0%	55	3.2%	137	8.8%	60	3.8%	0.7%	0.7%
Stoughton, City	413	3.3%	153	1.2%	615	4.9%	230	1.8%	1.5%	0.6%
Sun Prairie, City	1,492	7.3%	555	2.7%	4,275	14.6%	1,253	4.3%	7.2%	1.5%
Verona, City	179	2.5%	50	0.7%	713	6.7%	258	2.4%	4.2%	1.7%
Waunakee, Village	174	1.9%	86	1.0%	505	4.2%	269	2.2%	2.2%	1.3%
Windsor, Town/Village	174	3.3%	61	1.2%	364	5.7%	129	2.0%	2.4%	0.9%
Madison, Town	2,661	38.0%	1,455	20.8%	2,849	45.4%	1,760	28.0%	7.4%	7.3%
Total	**44,947**	**13.0%**	**13,335**	**3.9%**	**70,590**	**17.7%**	**26,430**	**6.6%**	**4.6%**	**2.8%**

Source: Census

Hatchery Road, Allied Drive, Sheboygan Avenue, and the Southwest side. Outside of Madison, the Cities of Fitchburg and Sun Prairie saw the highest increases in minority population. The largest increase in the Hispanic population generally occurred east of Allied Drive in southwest Madison and south of Thurston Lane in north Fitchburg, as well as the area near Milwaukee Street/N. Thompson Drive on Madison's northeast side.

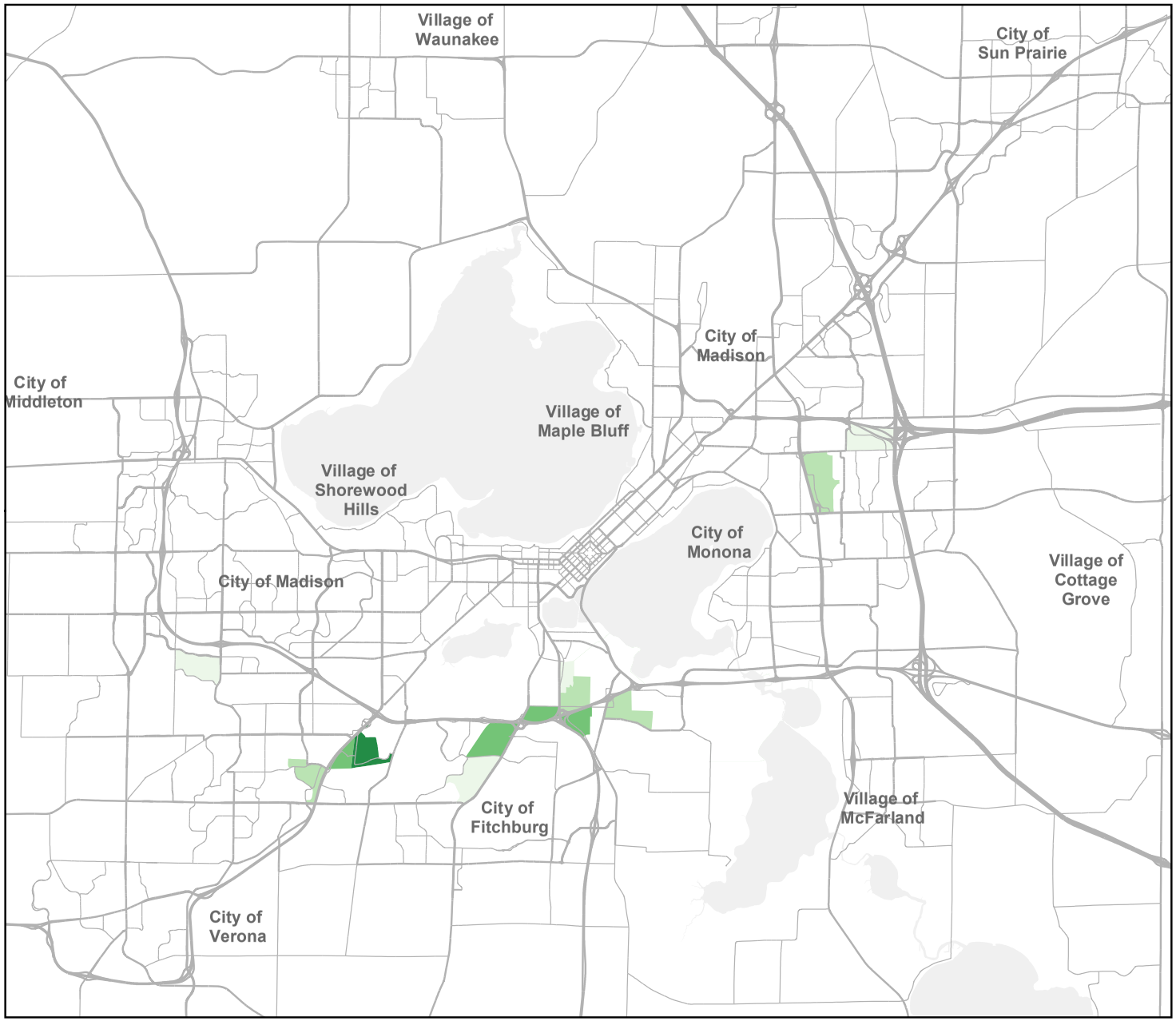
Figure B-6 on page A-38 shows the autoless households and households below the federal poverty level in cities and villages within the planning area and the Town of Madison in 2010-2014 and the change from 2000. The poverty level income for a family of four was $36,450 in 2016. There were an estimated total of nearly 17,000 households in these communities or about 9.5% that were without an automobile according to 2010-2014 American Community Survey (ACS) data. About 78% of these households resided in the City of Madison. There were an estimated total of over 23,000 households or about 13.5% that were below the poverty level. About 76% of these households were in the City of Madison. Figures B-7 and B-8 highlights areas, primarily within Madison, with concentrations of autoless and very low income households. The largest concentrations are in the downtown area, though many of these are students who have parental financial support. Other areas include the south side, Allied Drive, north side, and Darbo-Worthington neighborhood south of E. Washington Ave.

Means of Transportation and Travel Time to Work for Environmental Justice Populations

Figures B-9 to B-11 on page A-38 show the means of transportation to work by race, ethnicity and income in relation to poverty level in the Madison Urban Area, based on estimates from 2010-2014 ACS data. The data show that minority, Hispanic, and low income persons use alternatives to driving alone at a much higher rate than non-Hispanic, white persons. Around 72% of white,

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Areas with Concentrations of Hispanic Populations



Concentration of Hispanic Populations by Census Block Group

- 0% - 25%
- 26% - 30%
- 31% - 40%
- 41% - 50%
- 51% - 100%

Source:
U.S. Census Bureau
ACS 2010-2014 five-year estimates.

The geography is the urban residential areas of Census Block Groups

Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

0 0.5 1 Miles

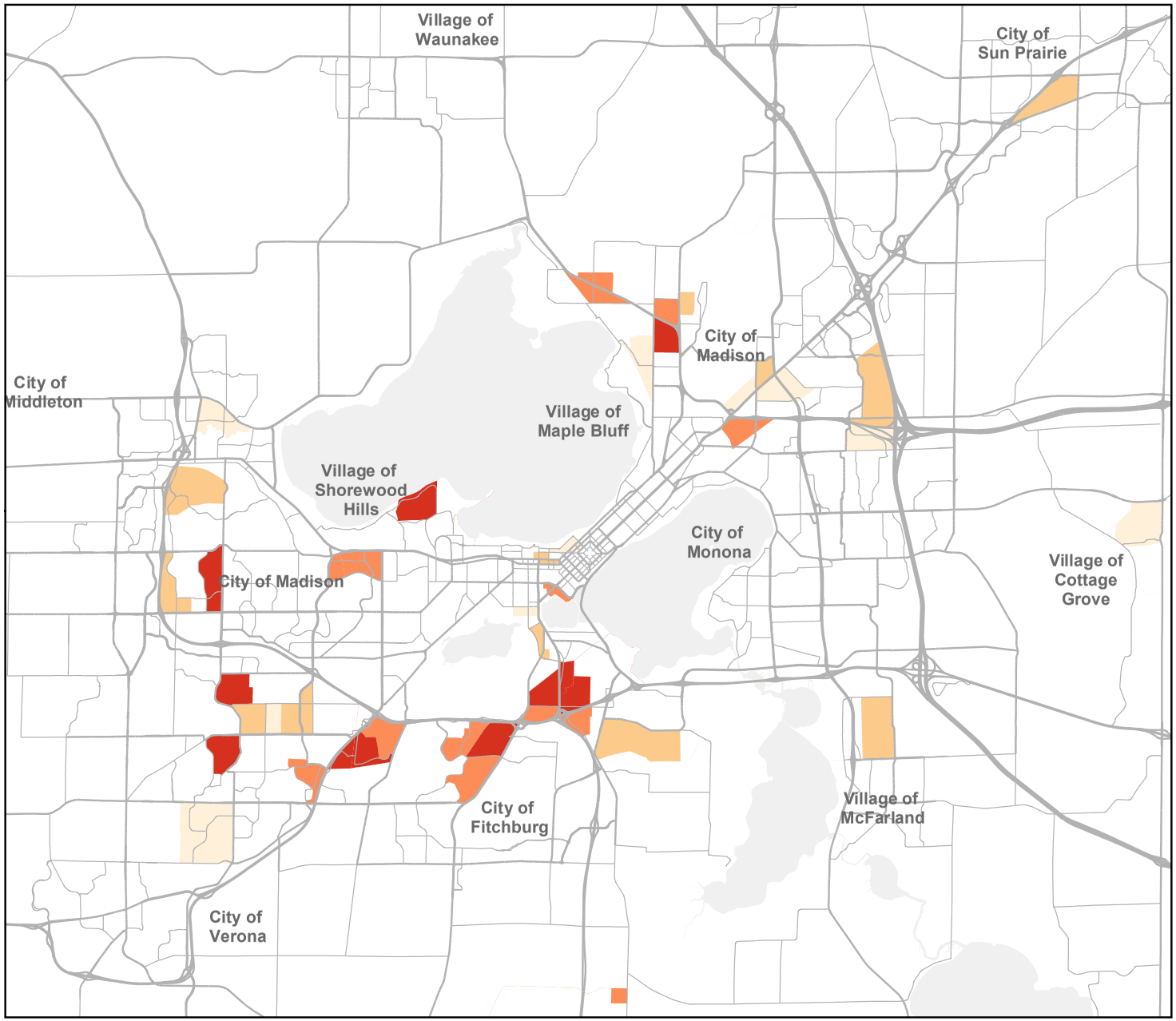
Date Revised: 2/8/2017

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Figure: B-2

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Areas with Concentrations of Minority Populations



Concentration of Minority Populations by Census Block Group

- 0% - 25%
- 26% - 30%
- 31% - 40%
- 41% - 50%
- 51% - 100%

Source:
U.S. Census Bureau
ACS 2010-2014 five-year estimates.

The geography is the urban residential areas of Census Block Groups

Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board

0 0.5 1
Miles

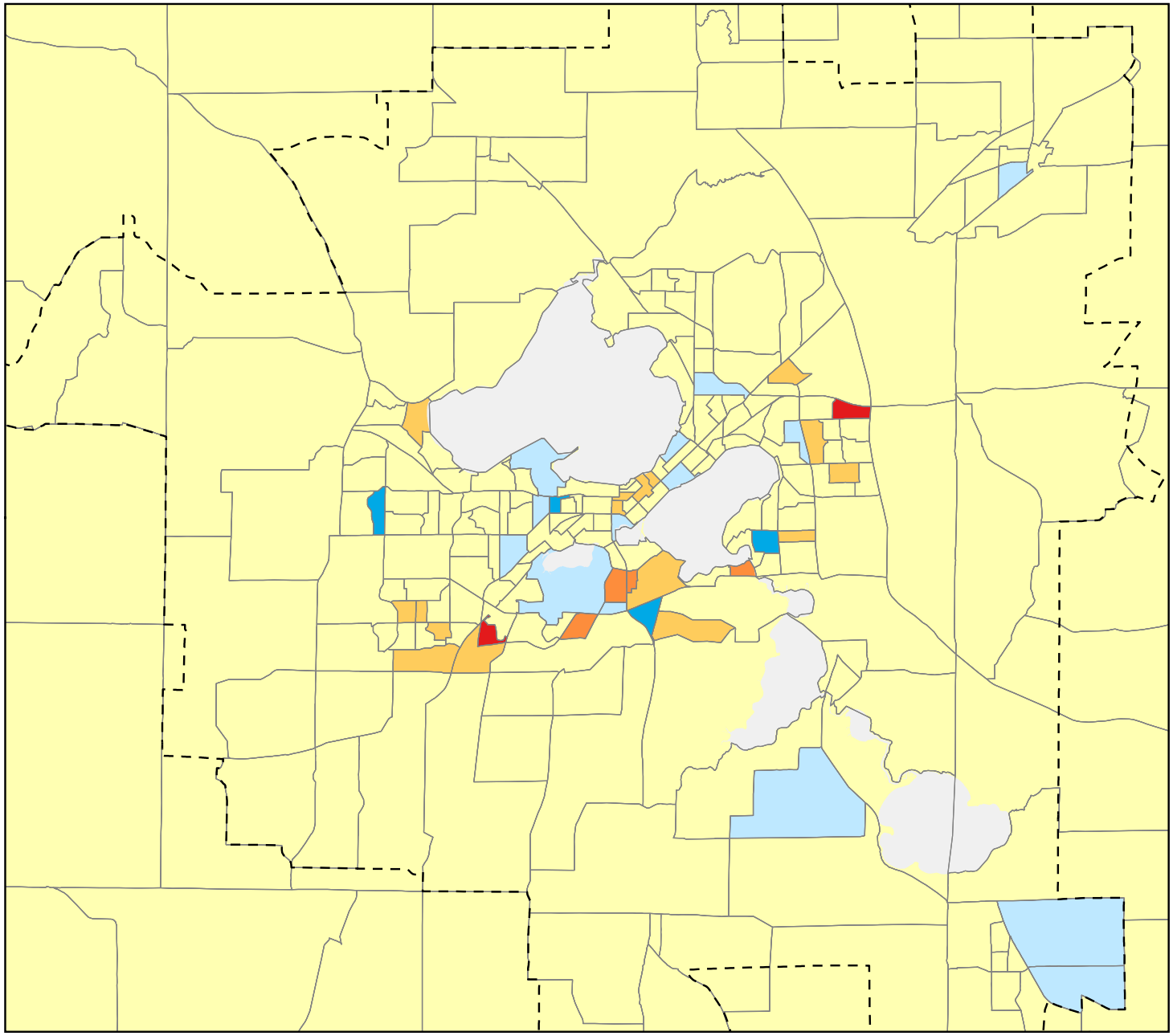
Date Revised: 2/8/2017

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Figure: B-3

Regional Transportation Plan 2050
Charting Our Course
Madison Area

Change in Hispanic Population from 2000 to 2010



Change per Square Mile

- -387 to -180
- -179 to -1
- 0 to 300
- 301 to 700
- 701 to 1400
- 1401 to 4417
- MPO Boundary

Note:
2010 census block group population was aggregated to 2000 census block groups to calculate change in population.

Source:
2000 and 2010 Census Block Group Population

Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

Source Info:
Street Base: 2017 (MATPB, DCLIO)

0 0.75 1.5
Miles

Date Revised: 1/20/2017

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Figure: B-4

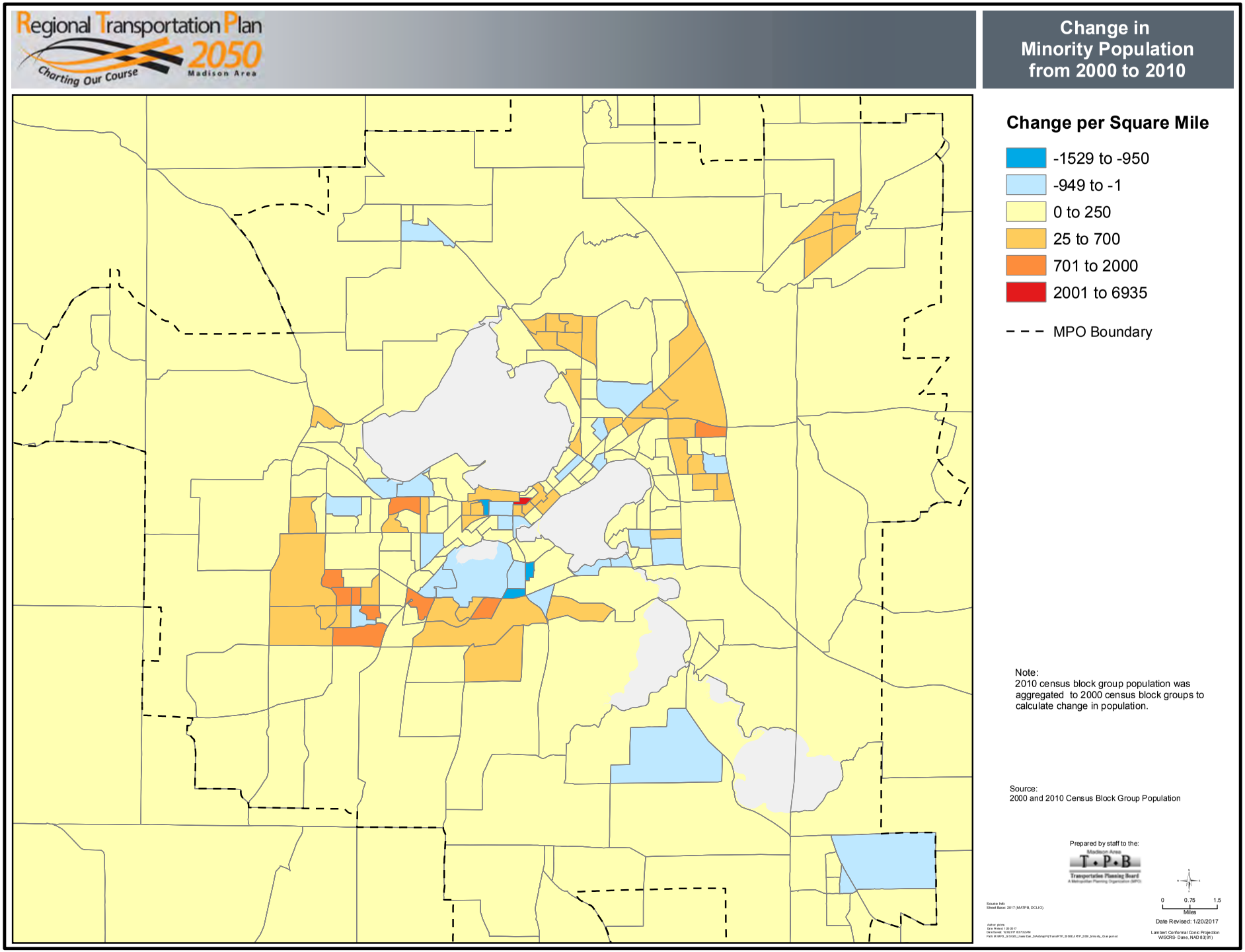
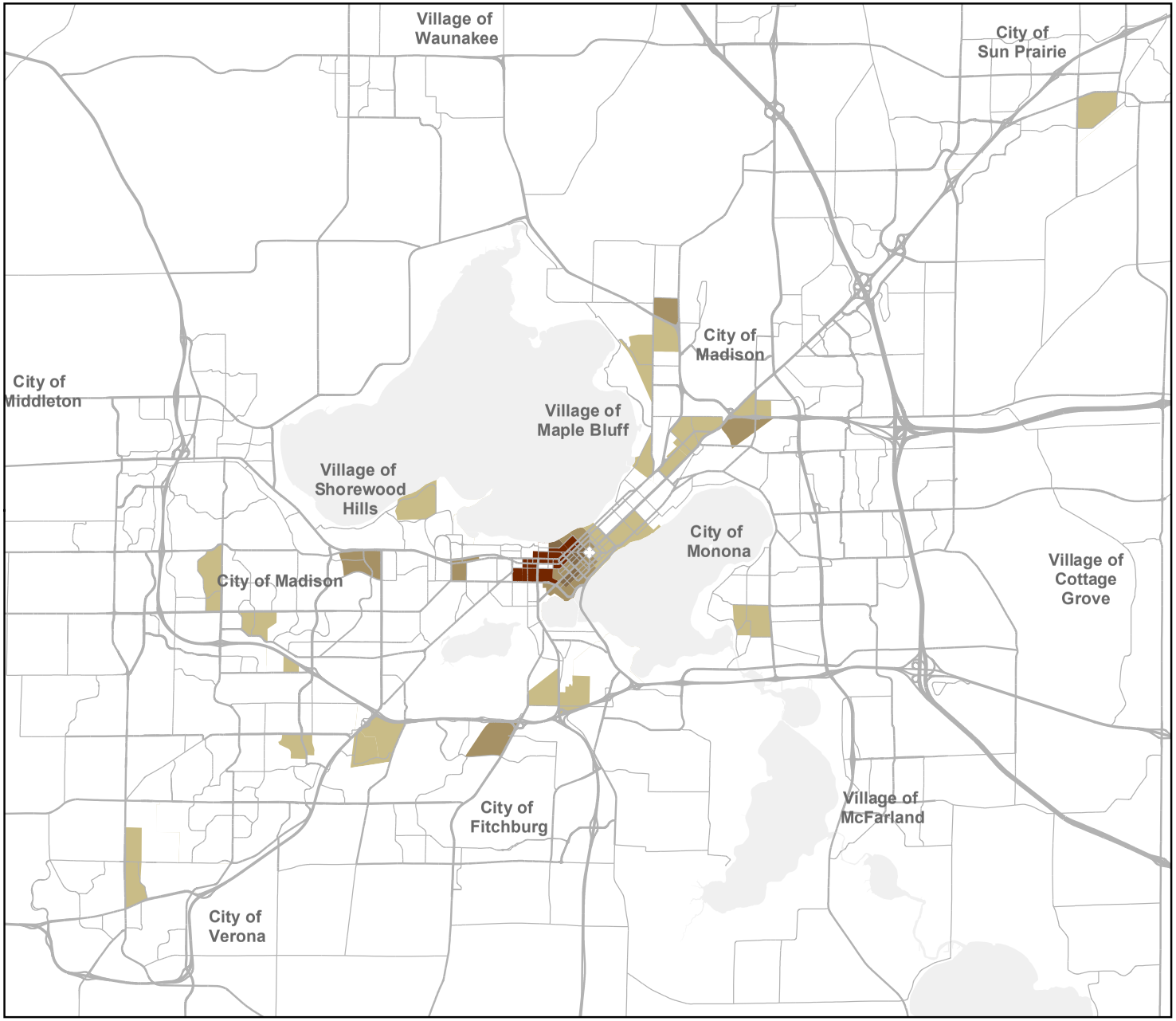

Regional Transportation Plan 2050
Charting Our Course
Madison Area
Change in Minority Population from 2000 to 2010
Change per Square Mile
-1529 to -950
-949 to -1
0 to 250
25 to 700
701 to 2000
2001 to 6935
MPO Boundary
Note:
2010 census block group population was aggregated to 2000 census block groups to calculate change in population.
Source:
2000 and 2010 Census Block Group Population
Prepared by staff to the:
Madison Area T • P • B Transportation Planning Board
A Metropolitan Planning Organization (MPO)
0 0.75 1.5
Miles
Date Revised: 1/20/2017
Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Figure: B-5

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Areas with Concentrations of Autoless Households



Percentage of Households with No Vehicle Available by Census Block Group

- 0% - 15%
- 16% - 25%
- 26% - 35%
- 36% - 50%
- 51% - 100%

Source:
U.S. Census Bureau
ACS 2010-2014 five-year estimates.

The geography is the urban residential areas of Census Block Groups

Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

0 0.5 1
Miles

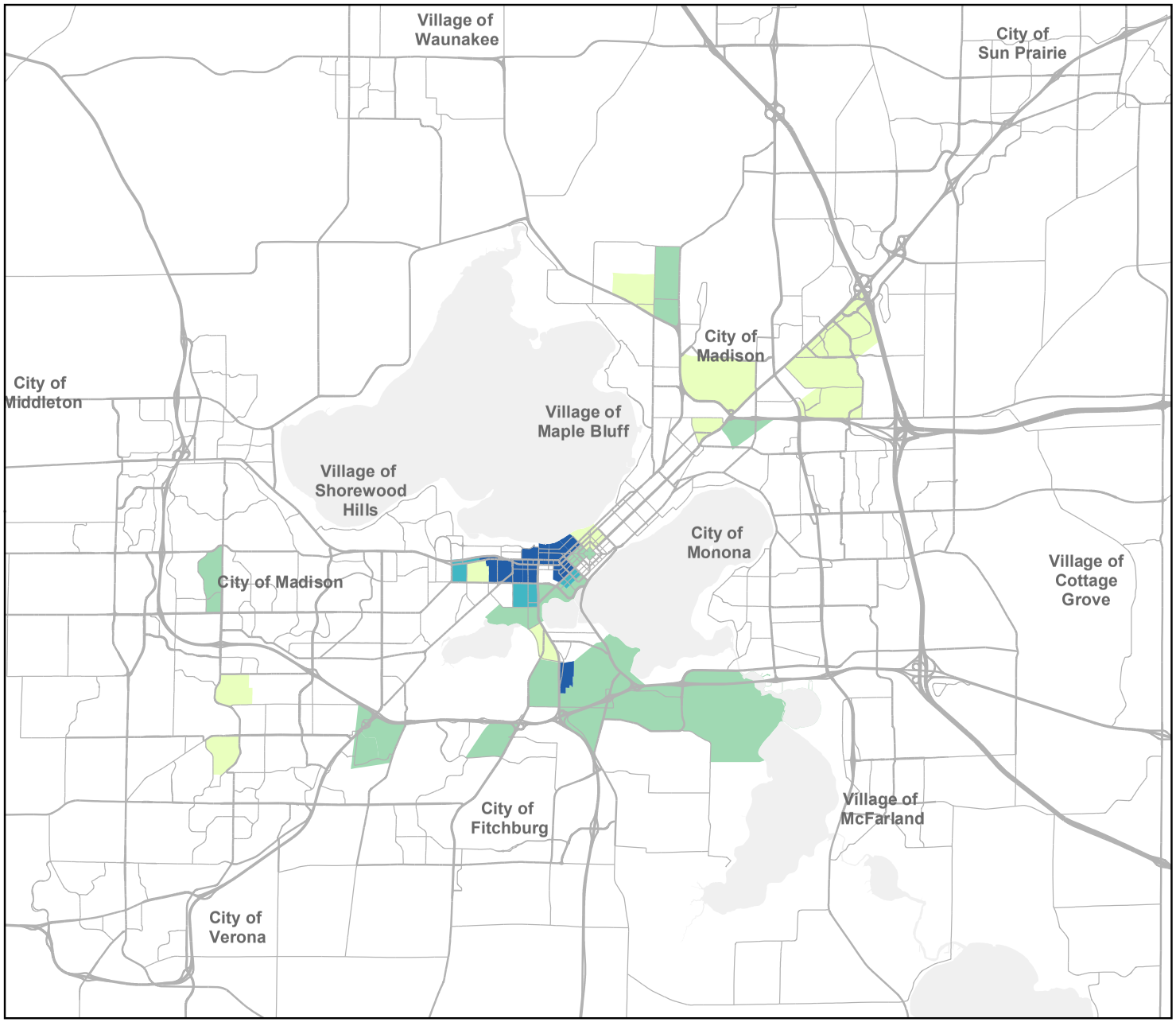
Date Revised: 2/8/2017

Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

Figure: B-7

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Areas with Concentrations of Households Below Poverty Level



Percentage of Households below Poverty Level by Census Block Group

- 0% - 25%
- 26% - 30%
- 31% - 40%
- 41% - 50%
- 51% - 100%

Source:
U.S. Census Bureau
ACS 2010-2014 five-year estimates.

The geography is the urban residential areas of Census Block Groups

Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

0 0.5 1
Miles

Date Revised: 2/6/2017

Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

Figure: B-8

Figure B-*6*

Autoless Households and Households Below Poverty Level within the Madison Metropolitan Area

Municipality	2000 Autoless Households			2000 Households Below Povery Level			2010-14 Autoless Households			2010-14 Households Below Povery Level*			Autoless Households Change	Households Below Povery Level* Change
	Number	Tot HHs	Percent	Number	Tot HHs	Percent	Number	Tot HHs	Percent	Number	Tot HHs	Percent		
Madison, City	10,483	88,845	11.8%	12,269	89,267	13.7%	12,948	103,169	12.6%	17,910	103,169	17.4%	0.8%	3.6%
Cottage Grove, Village	20	1,416	1.4%	45	1,414	3.2%	31	2,268	1.4%	169	2,268	7.5%	0.0%	4.3%
Cross Plains, Village	36	1,203	3.0%	26	1,215	2.1%	64	1,486	4.3%	69	1,486	4.6%	1.3%	2.5%
DeForest, Village	78	2,651	2.9%	111	2,647	4.2%	107	3,505	3.1%	127	3,505	3.6%	0.1%	-0.6%
Fitchburg, City	433	8,370	5.2%	457	8,137	5.6%	676	10,407	6.5%	1,319	10,407	12.7%	1.3%	7.1%
Maple Bluff, Village	7	541	1.3%	10	550	1.8%	3	581	0.5%	8	581	1.4%	-0.8%	-0.4%
McFarland, Village	66	2,439	2.7%	60	2,455	2.4%	117	3,260	3.6%	114	3,260	3.5%	0.9%	1.1%
Middleton, City	396	7,042	5.6%	335	6,936	4.8%	456	8,549	5.3%	502	8,549	5.9%	-0.3%	1.0%
Monona, City	287	3,789	7.6%	179	3,769	4.7%	275	3,972	6.9%	455	3,972	11.5%	-0.7%	6.7%
Oregon, Village	125	2,814	4.4%	111	2,847	3.9%	171	3,779	4.5%	190	3,779	5.0%	0.1%	1.1%
Shorewood Hills, Village	8	649	1.2%	16	624	2.6%	3	657	0.5%	24	657	3.7%	-0.8%	1.1%
Stoughton, City	221	4,772	4.6%	259	4,742	5.5%	318	5,269	6.0%	459	5,269	8.7%	1.4%	3.2%
Sun Prairie, City	331	7,794	4.2%	382	7,792	4.9%	458	12,029	3.8%	922	12,029	7.7%	-0.4%	2.8%
Verona, City	139	2,576	5.4%	107	2,548	4.2%	284	4,800	5.9%	235	4,800	4.9%	0.5%	0.7%
Waunakee, Village	181	3,202	5.7%	71	3,216	2.2%	205	4,530	4.5%	184	4,530	4.1%	-1.1%	1.9%
Windsor, Town/Village	58	1,902	3.0%	18	1,923	0.9%	152	2,546	6.0%	127	2,546	5.0%	2.9%	4.1%
Madison, Town	390	3,220	12.1%	602	3,230	18.6%	358	3,108	11.5%	756	3,108	24.3%	-0.6%	5.7%
Total	13,259	143,225	9.3%	15,058	143,312	10.5%	16,626	173,915	9.6%	23,570	173,915	13.6%	-	-

Source: Census

Figure B-*9*

Means of Transportation to Work by Race, Urban Area, 2010-2014*

Mode of Transportation	White		African American		Asian		Other Race or 2+ Races	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Drive Alone	141,649	72.4%	5,901	59.3%	7,134	58.9%	5,847	60.2%
Carpooled	14,992	7.7%	1,292	13.0%	1,322	10.9%	1,579	16.3%
Public Transportation	9,563	4.9%	1,408	14.2%	2,143	17.7%	874	9.0%
Walked	12,130	6.2%	743	7.5%	892	7.4%	860	8.9%
Bicycle, Taxicab, Motorcycle, or Other	8,847	4.5%	378	3.8%	301	2.5%	400	4.1%
Worked at Home	8,581	4.4%	224	2.3%	318	2.6%	147	1.5%
Total	195,762	-	9,946	-	12,110	-	9707	-

Source: 2010-2014. For workers 16 years and older.

Figure B-*10*

Means of Transportation to Work by Ethnicity, Urban Area, 2010-2014*

Mode of Transportation	White, Non Hispanic		Hispanic or Latino	
	Number	Percent	Number	Percent
Drive Alone	136,242	72.4%	8,736	65.1%
Carpooled	13,967	7.4%	2,432	18.1%
Public Transportation	9,061	4.8%	1,004	7.5%
Walked	11,713	6.2%	747	5.6%
Bicycle, Taxicab, Motorcycle, or Other	8,647	4.6%	324	2.4%
Worked at Home	8,491	4.5%	178	1.3%
Total	188,121	-	13,421	-

Source: 2010-2014. For workers 16 years and older.

Figure B-*11*

Means of Transportation to Work by Poverty Status, Urban Area, 2010-2014*

Mode of Transportation	Below 100% Poverty Level		Below 150% Poverty Level		At or Above 150% Poverty Level	
	Number	Percent	Number	Percent	Number	Percent
Drive Alone	9,741	44.4%	17,068	48.5%	143,129	75.5%
Carpooled	1,959	8.9%	3,644	10.4%	15,506	8.2%
Public Transportation	3,012	13.7%	4,746	13.5%	9,065	4.8%
Walked	4,621	21.1%	6,001	17.1%	6,844	3.6%
Bicycle, Taxicab, Motorcycle, or Other	1,990	9.1%	2,751	7.8%	6,908	3.6%
Worked at Home	622	2.8%	968	2.8%	8,042	4.2%
Total	21,945	-	35,178	-	189,494	-

Source: 2010-2014. For workers 16 years and older.

non-Hispanic persons drove alone to work compared to just 59% of minority, 65% of Hispanic, and 48% of low-income persons (i.e., workers with income below 150% of the federal poverty level). For minorities and Hispanic persons, the most common alternative transportation modes were carpooling (13% and 18% respectively) and transit (14% and 7.5%). For low-income workers, the most common alternative mode was walking (17%) with transit and carpooling both around 13.5% and 10.5%, respectively.

The Metro Transit on-board survey conducted in 2015 showed that minorities make longer transit trips and transfer more often. This is largely due to their residence and destination locations outside the downtown/UW campus area where most service is oriented. More recent data is unavailable, but according to 2000 Census data minority and Hispanic persons had somewhat longer overall travel times to work (regardless of mode) than white, non-Hispanic persons. Around 19.5% of minority persons and 18% of Hispanic persons had travel times of 30 minutes or greater compared to 16% of white, non-Hispanic persons. Around 55% of minorities had travel times of less than 20 minutes compared to 57% of white, non-Hispanic persons. The higher overall travel times for minorities can be partially attributed to their far greater use of car/vanpools and transit. Average travel times for those modes are longer than for those driving alone, as one would expect.

Roadway and Bicycle/Pedestrian Project Analysis

A qualitative transportation project analysis was conducted comparing the location of planned projects in relation to areas with concentrations of environmental justice (EJ) populations. Figures B-12 to B-14 overlay the recommended major capacity expansion roadway and transit improvements and studies, roadway preservation and TSM/safety projects, and priority bicycle facility projects on maps highlighting EJ population indicator areas with high concentrations of one or more of EJ population groups (minority and Hispanic populations, population below the poverty level, and households with no vehicle available).

Roadway Projects & Studies

Roadway capacity expansion projects improve auto mobility for persons residing in or traveling to areas in the general vicinity of the roadway, but can have negative impacts on persons residing adjacent or in close proximity to the roadway. Roadway preservation, TSM (e.g., intersection improvement), or safety projects are generally considered to have a positive impact on the adjacent properties, particularly when they include pedestrian/bicycle facilities and streetscape improvements. Some negative impacts may occur during construction of the project (e.g., noise, dust, etc.), however the potential benefits of the project (e.g., improved safety and traffic flow, smoother pavement, improved pedestrian and bicycle facilities, streetscape amenities) are assumed to outweigh the negative impacts. Bicycle facilities also have a positive impact on the adjacent neighborhood area by improving non-motorized accessibility.

As shown in Figure B-12, all of the recommended local arterial capacity expansion projects in the planning area are located on the urban periphery in developing or planned development areas, most notably the east and west sides. There are no EJ areas in the vicinity of these projects. The closest project to an EJ area is the Commercial Avenue (CTH T) (N. Thompson Dr. to Lien Road) project near the Ridgewood neighborhood, however converting that roadway to an urban 4-lane divided cross-section will not negatively impact the nearby neighborhood. In fact, it will have positive impacts through addition of pedestrian/bicycle facilities, street lights, street trees, and other typical components of an urban street project.

The recommended major state roadway capacity expansion projects include the programmed reconstruction and expansion of Verona Road (US 18/151), which is Phase 2 of the larger Verona Road and West Beltline project. Phase 1, which was recently completed, included reconstruction of the Verona Road/Beltline interchange to a single-point design, expansion of the Beltline to 6 lanes west to Whitney Way, and expansion of Verona Road south of the interchange to 8 lanes with a new-grade-separated crossing of Verona Road with the Summit Road jug handle. While the project has some negative impacts to the adjacent Allied Drive – Dunn's Marsh neighborhood, multiple improvements were incorporated into the project to increase neighborhood motorized and non-motorized access, including the new grade-separated crossing at Summit Road, the design of the

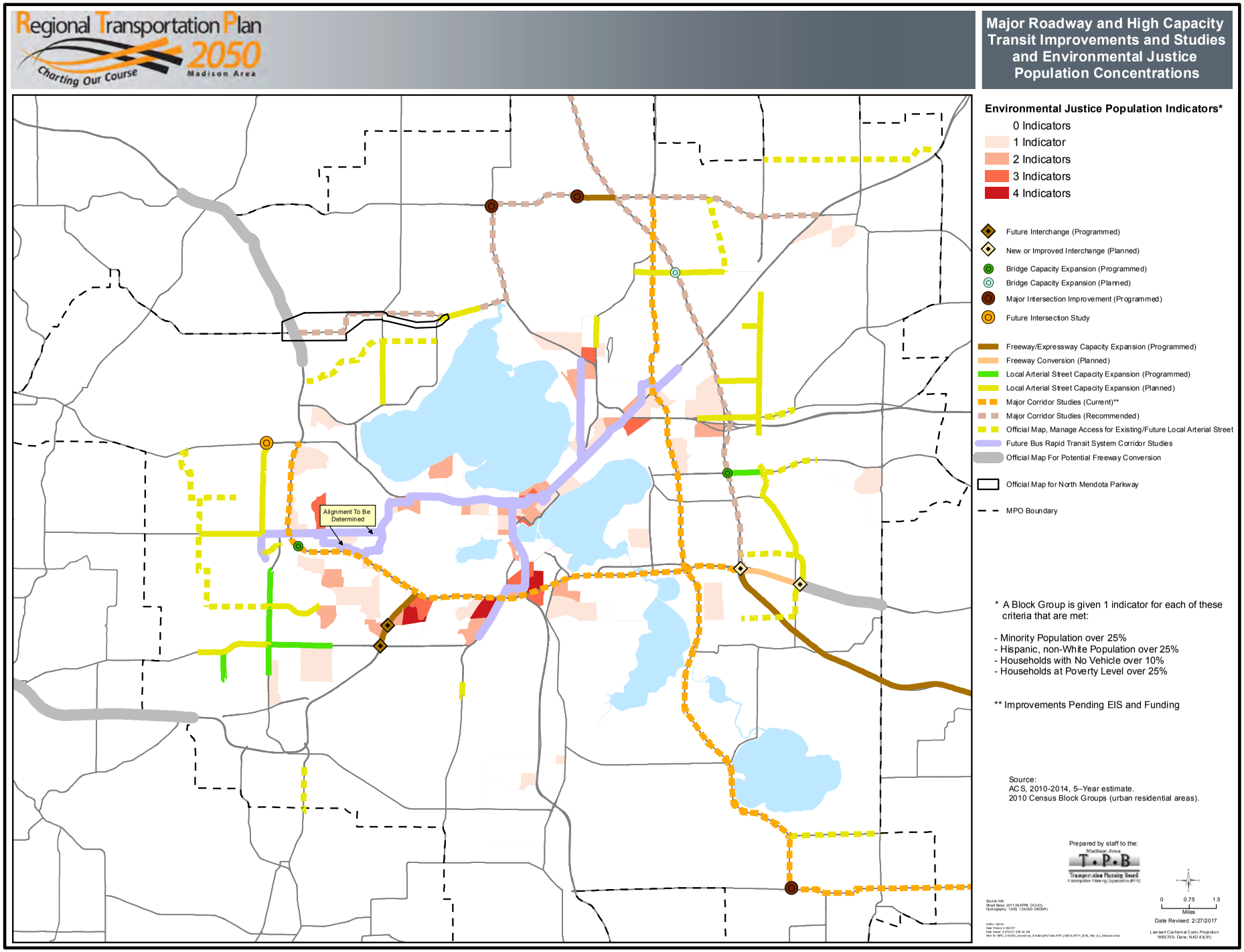

Regional Transportation Plan 2050
Charting Our Course
Madison Area
Major Roadway and High Capacity Transit Improvements and Studies and Environmental Justice Population Concentrations
Environmental Justice Population Indicators*
0 Indicators
1 Indicator
2 Indicators
3 Indicators
4 Indicators
Future Interchange (Programmed)
New or Improved Interchange (Planned)
Bridge Capacity Expansion (Programmed)
Bridge Capacity Expansion (Planned)
Major Intersection Improvement (Programmed)
Future Intersection Study
Freeway/Expressway Capacity Expansion (Programmed)
Freeway Conversion (Planned)
Local Arterial Street Capacity Expansion (Programmed)
Local Arterial Street Capacity Expansion (Planned)
Major Corridor Studies (Current)**
Major Corridor Studies (Recommended)
Official Map, Manage Access for Existing/Future Local Arterial Street
Future Bus Rapid Transit System Corridor Studies
Official Map For Potential Freeway Conversion
Official Map for North Mendota Parkway
MPO Boundary
Alignment To Be Determined
* A Block Group is given 1 indicator for each of these criteria that are met:
- Minority Population over 25%
- Hispanic, non-White Population over 25%
- Households with No Vehicle over 10%
- Households at Poverty Level over 25%
** Improvements Pending EIS and Funding
Source:
ACS, 2010-2014, 5--Year estimate.
2010 Census Block Groups (urban residential areas).
Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board
0 0.75 1.5
Miles
Date Revised: 2/27/2017
Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Figure: B-12

connection to the jug handle to the east frontage road, the construction of a new pedestrian/bicycle underpass just south of the Beltline interchange, a new Carling Drive connection, and other pedestrian/bicycle facilities. Phase 2 of the project includes expansion of Verona Road from Raymond Road to McKee Road (CTH PD) with new interchanges at Williamsburg Way and McKee Road. This will ultimately result in higher traffic volumes in the corridor, but to the extent the Verona Road improvements improve traffic flow and reduce crashes, air quality in the area could be improved to some degree.

Other programmed capacity projects include the Interstate 39/90 expansion project, which is mostly outside the planning area and is addressing inter-regional traffic, and a short rural section of WIS 19 between River Road and the Interstate that is being expanded in conjunction with a bridge replacement. Neither project affects EJ areas. The only state highway planned capacity project in the plan at this time includes the Beltline/Interstate interchange project, which includes the conversion of US 12/18 to a freeway and a new interchange at CTH AB. There does not appear to be any adverse impacts to EJ areas from the project, but a more detailed analsis will be conducted as part of the EIS for the project.

It is anticipated that additional capacity expansion projects will come out of ongoing studies of three state highway corridors and recommended future studies of two of these corridors. The three ongoing studies include Stoughton Road/US 51 (Terminal Drive to WIS 19), Beltline (US 12/14/18/151) (US 14 to CTH N), and US 51 (McFarland to Stoughton). Future studies are recommended for the Interstate 39/90/94 and WIS 19/WIS 113/CTH M ("N. Mendota Parkway") corridors. Depending upon the improvements recommended, projects coming out of these studies could result in impacts to some EJ areas, particularly in the Beltline and Stoughton Road corridors. Impacts to EJ areas will be evaluated as part of detailed analyses conducted as part of these major studies.

Figure B-13 shows the location of programmed and planned roadway preservation, TSM, and safety projects in relation to areas with concentrations of EJ populations. There are a significant number of anticipated reconstruction projects and other projects located in or near EJ areas that will benefit them. These include the following:

- N. Blair Street (Johnson St. to E. Washington Ave.
- Bird Street (W. Main to Linnerud Dr.) in Sun Prairie
- E. Wilson Street/Williamson Street (Franklin St. to Blount St.)
- S. Park Street (US 151) (W. Washington Ave. to Badger Rd.)
- S. Gammon Road (Mineral Point Rd. to Beltline (US 12/14))
- W. Washington Avenue (Regent St. to Bedford St.)
- N. Fish Hatchery Road (S. Park St. to Wingra Dr.)
- North Shore Drive/Proudfit Street (John Nolen Dr. to W. Washington Ave.)
- Regent Street (Highland Ave. to Park St.)
- E. Johnson Street (Baldwin St. to First St.)
- N. Midvale Boulevard (University Ave. to Regent St.)
- Milwaukee Street (E. Washington Ave. to Schenk St.)
- Siggelkow Road (Catalina Pkwy. to CTH AB)
- Cottage Grove Road (CTH BB) (N. Main St. to Sandpiper Trail) in Cottage Grove

Most of these projects will incorporate significant pedestrian/bicycle and streetscape improvements, and some will also include safety improvements.

Bicycle/Pedestrian Projects

Bicycle/pedestrian facilities benefit areas in which they are located or those nearby by improving non-motorized accessibility

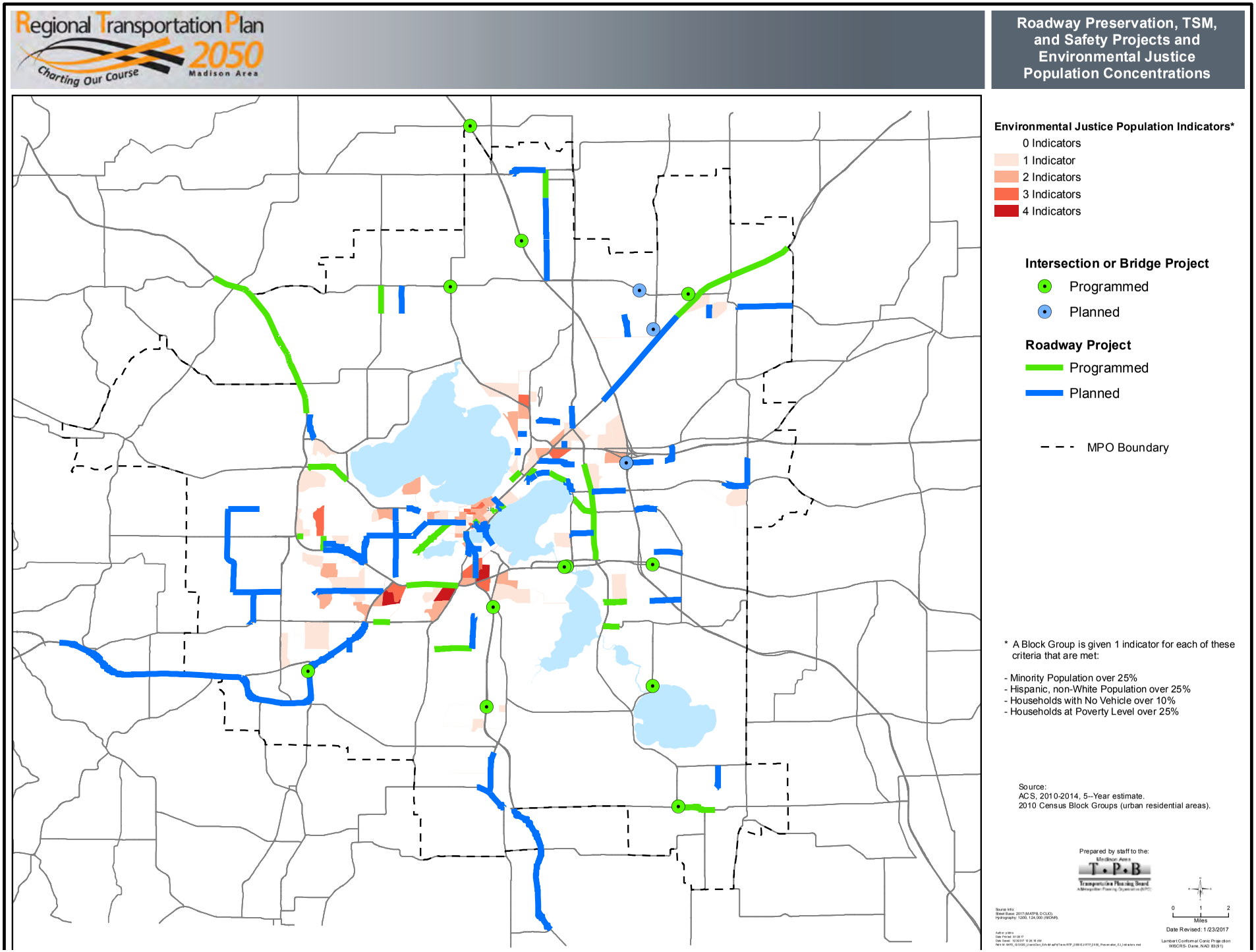

Regional Transportation Plan 2050
Charting Our Course
Madison Area
Roadway Preservation, TSM, and Safety Projects and Environmental Justice Population Concentrations
Environmental Justice Population Indicators*
0 Indicators
1 Indicator
2 Indicators
3 Indicators
4 Indicators
Intersection or Bridge Project
Programmed
Planned
Roadway Project
Programmed
Planned
MPO Boundary
* A Block Group is given 1 indicator for each of these criteria that are met:
- Minority Population over 25%
- Hispanic, non-White Population over 25%
- Households with No Vehicle over 10%
- Households at Poverty Level over 25%
Source:
ACS, 2010-2014, 5--Year estimate.
2010 Census Block Groups (urban residential areas).
Prepared by staff to the:
Madison Area
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Miles
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Figure: B-13

and strengthening the social fabric of the neighborhoods. Many minority and low-income neighborhoods are served, directly or indirectly, with high-quality regional shared-use paths and on-street bicycle facilities. However, the neighborhoods often lack a connected local street network and in many cases, the neighborhoods are isolated from others and the rest of the community because of barriers like the Beltline Highway and high volume arterials like Northport Road and E. Washington Ave.

Figure B-14 shows the programmed and planned priority on-street facility needs and recommended off-street bicycle/pedestrian facility projects in relation to areas with high concentrations of EJ population groups.

Neighborhoods along the Madison-Fitchburg border are currently served by the Southwest Path and new Cannonball Path, both along former rail corridors with Beltline Highway crossings separated from traffic. These neighborhoods will be even better served with the following planned facilities: extension of the Cannonball path to the Wingra path; improved bicycle facilities along South Park Street; Beltline Highway street crossing at Perry Street; shared-use path along the Beltline Highway connecting the Southwest path with west Madison; and new and/or improved on-street bicycle facilities on McKee Road, Midvale Boulevard, and Whitney Way.

Low-income and minority neighborhoods in northeast Madison are served by a network of primarily on-street facilities – bike lanes on Milwaukee Street, Thompson Drive, and East Washington Avenue. However, a low-stress network consisting of low-speed streets and shared-use paths is lacking. The planned Goodman Path in the rail corridor paralleling E Washington Ave./US 151 and shared-use path along STH-30 and I-94 will improve bicycle travel for these neighborhoods. New and improved crossings of the I-39/90/94 will improve safety and allow access between existing and developing neighborhoods.

North Madison neighborhoods have historically had limited access to bicycle facilities. New bike lanes on Sherman Avenue, Northport Drive, and other smaller improvements have improved access in the last few years. The long-planned "Sherman Flyer" shared-use path along the rail corridor will dramatically improve access, as well as the planned completion of bicycle facilities along the East Johnson Street/Packers Avenue Corridor.

Figure 5-11 on page 5-23 shows regional pedestrian network needs, categorized as Tier 1 (highest priority) and Tier 2. Sidewalk needs – missing sidewalk along arterial and collector streets in urban areas where pedestrians would use it – are scattered throughout the region. Some of these missing sidewalk segments are in low-income and minority neighborhoods, though many are not.

In southwest Madison, Hammersley Road is a notable gap in the pedestrian network between the Southwest Path and Brookwood Road/Rae Lane. Other examples of missing regional sidewalk connections in low-income and minority neighborhoods are Mendota Avenue in Middleton, Gammon Road near Old Sauk Road, Atlas Avenue, Commercial Avenue, Wright Street, Packers Avenue, and Troy Drive west of the railroad crossing. Additionally, missing sidewalk in commercial areas – wherever they are – are important from an equity standpoint because low-income people are likely work or shop there. Most large retail areas generally have sidewalks, although many are auto-oriented and difficult to reach from residential neighborhoods.

Public Transit Analysis

Current Transit Service

The Metro Transit all-day service area encompasses almost all of the areas with concentrations of EJ population groups. The one exception is some areas in Sun Prairie, which are served by the city's shared-ride taxi system, but do not have access to affordable transit service to/from the Madison area. The main challenge for bus riders in the Madison area EJ areas is relatively long travel times and sometimes low frequency and limited service. This stems in large part due to the fact that many of the EJ areas are located in the periphery of the urban area.

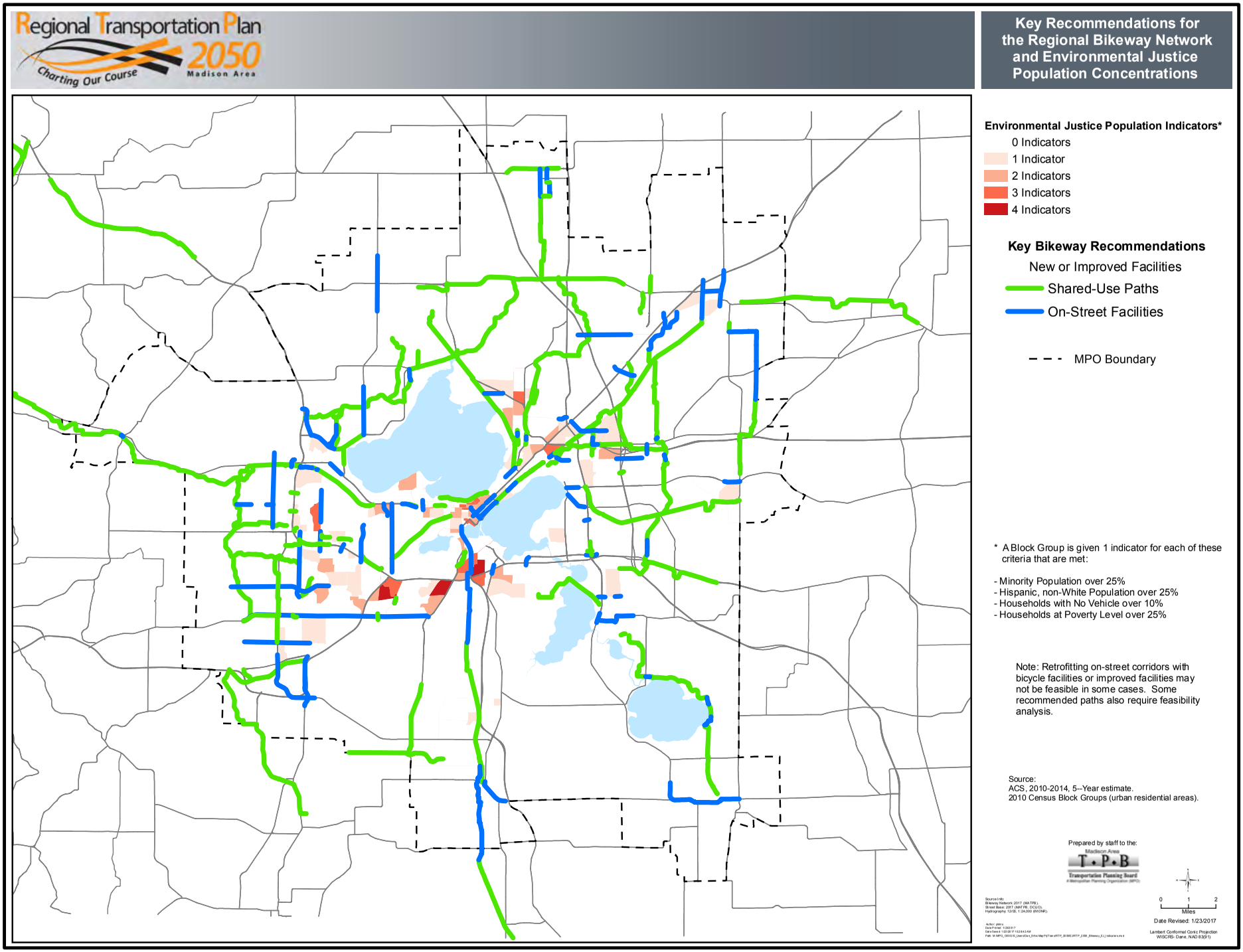

Regional Transportation Plan 2050
Charting Our Course
Madison Area
Key Recommendations for the Regional Bikeway Network and Environmental Justice Population Concentrations
Environmental Justice Population Indicators*
0 Indicators
1 Indicator
2 Indicators
3 Indicators
4 Indicators
Key Bikeway Recommendations
New or Improved Facilities
Shared-Use Paths
On-Street Facilities
MPO Boundary
* A Block Group is given 1 indicator for each of these criteria that are met:
- Minority Population over 25%
- Hispanic, non-White Population over 25%
- Households with No Vehicle over 10%
- Households at Poverty Level over 25%
Note: Retrofitting on-street corridors with bicycle facilities or improved facilities may not be feasible in some cases. Some recommended paths also require feasibility analysis.
Source:
ACS, 2010-2014, 5--Year estimate.
2010 Census Block Groups (urban residential areas).
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Figure: B-14

Isochrone maps can be used to approximate how far a person can travel using public transit (or other modes) in a given amount of time. This analysis is useful because it shows a person's freedom of travel – in other words, whether they are isolated within their neighborhood or whether they have reasonable access to jobs, retail, services, and other opportunities that Madison has to offer. Figures B-15 to B-19 are a series of Isochrone maps produced to illustrate (a) areas accessible within a 30-minute bus ride from selected EJ areas in the weekday morning peak and midday periods; (b) areas accessible within a 45-minute bus ride from major employment centers in the weekday afternoon peak and midday periods; and (c) areas accessible within a 15-minute bus ride from a full service grocery store.

Figures B-15 and 16 highlight the limited portions of the Madison area that are accessible to EJ neighborhoods within a 30-minute bus ride, making it difficult reach cross-town destinations via transit (e.g., Allied neighborhood to the job center on the north side). Figures B-17 and 18 show that the 45-minute transit accessibility to peripheral job centers is generally limited to one side of the urban area (east, west, south). Again, cross-town trips are outside this time threshold. A comparison of Figure B-19 to the selected EJ areas shown in Figure B-15 shows that most EJ areas are within a 15-minute bus ride of at least one full service grocery store. An exception is the Owl Creek neighborhood. However, that store may not meet residents' needs due to cost and other factors. The maps illustrate some of the challenges for the transit dependent in meeting their daily needs, despite the fact the Madison area has an excellent transit system for an urban area of Madison's size.

As part of its Title VI compliance monitoring, Metro Transit updated its Title VI Program document in 2014. A fixed-route service standards and policies analysis was conducted to ensure that the level of service and location of routes, age/quality of vehicles assigned to routes, and stop and other facilities are being provided in a non-discriminatory manner. The analysis compared the level of service for areas or routes used by minority concentrations to adopted service standards and the quality of service for these areas compared to non-minority areas/routes. The analysis concluded that service and facility quality for areas/routes with concentrations of minority and limited English proficient populations compared very favorably with non-minority areas and there were no disparate impacts on the basis of race, color, or national origin. Metro's Title VI policy calls for an equity analysis for any major service change, which focuses on any adverse effects to minority and low-income riders.

Planned Regional Transit Network and Service

The planned bus rapid transit (BRT) system will eventually span the majority of the service area. As illustrated in Figure B-12, the BRT system will directly serve the north Madison, south Madison, and north Fitchburg EJ areas, as well as low-income and minority populations along East Washington Avenue. Further, most neighborhoods will benefit from the BRT system because they will be able to use local routes to connect to the system, reducing their travel times, particularly for cross-town trips. The recent onboard transit survey showed that low-income and minority bus riders often make long trips, particularly outside the morning and afternoon peak commute periods, and often transfer. The BRT system will reduce travel times and transfers for these long trips.

As shown in Figure Figure 5-5 on page 5-13, the planned expansion of the frequent service improvements are primarily in downtown Madison and close-in neighborhoods. These improvements will serve low-income and zero-car households in central Madison. Although most of these corridors are in neighborhoods heavily populated with University of Wisconsin students, they are nonetheless highly dependent on public transportation. Planned improvements in off-peak frequency in southwest Madison, south Madison, and east Madison from what is now hourly service will directly benefit low-income neighborhoods.

New all-day service in peripheral neighborhoods will mostly serve as-of-yet undeveloped and developing neighborhoods. However, some benefits will be felt by low-income and minority neighborhoods. Improving service on Route 31 and providing local service on Monona Drive will improve access in southeast Madison, Monona, and McFarland. All-day service to central Fitchburg will allow residents throughout the city as well as others to reach the city center near Lacy Road and Fish Hatchery Road. All-day service in Sun Prairie, with quality connections at East Towne, will serve minority concentrations in the City of Sun

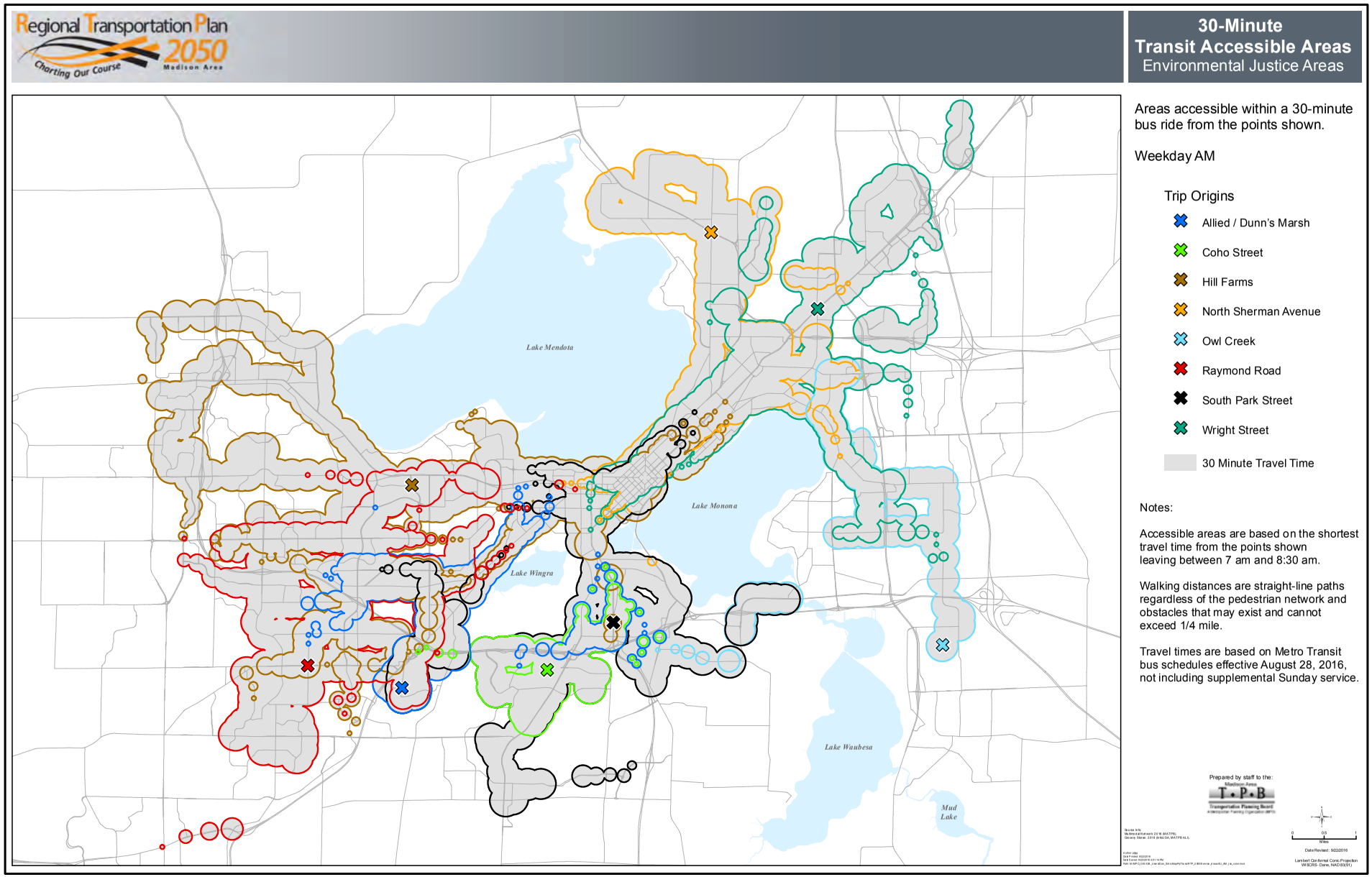

Regional Transportation Plan 2050
Charting Our Course
Madison Area
30-Minute
Transit Accessible Areas
Environmental Justice Areas
Areas accessible within a 30-minute bus ride from the points shown.
Weekday AM
Trip Origins
Allied / Dunn's Marsh
Coho Street
Hill Farms
North Sherman Avenue
Owl Creek
Raymond Road
South Park Street
Wright Street
30 Minute Travel Time
Notes:
Accessible areas are based on the shortest travel time from the points shown leaving between 7 am and 8:30 am.
Walking distances are straight-line paths regardless of the pedestrian network and obstacles that may exist and cannot exceed 1/4 mile.
Travel times are based on Metro Transit bus schedules effective August 28, 2016, not including supplemental Sunday service.
Lake Mendota
Lake Monona
Lake Wingra
Lake Waubesa
Mud Lake
Prepared by staff to the:
T • P • B
Miles
Date Revised: 9/22/2016
Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

Figure: B-15

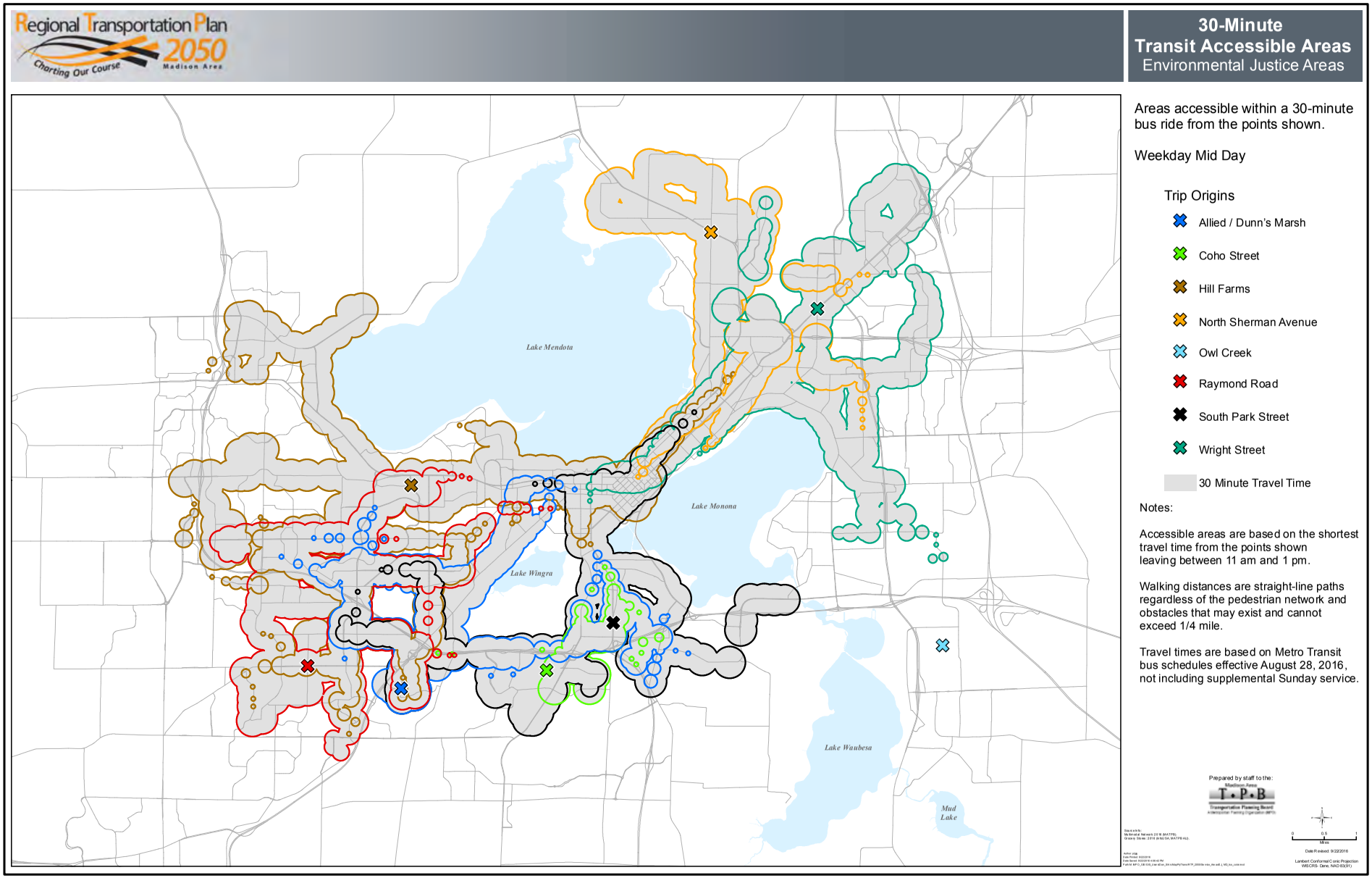

Regional Transportation Plan 2050
Charting Our Course
Madison Area
30-Minute
Transit Accessible Areas
Environmental Justice Areas
Lake Mendota
Lake Monona
Lake Wingra
Lake Waubesa
Mud Lake
Areas accessible within a 30-minute bus ride from the points shown.
Weekday Mid Day
Trip Origins
Allied / Dunn's Marsh
Coho Street
Hill Farms
North Sherman Avenue
Owl Creek
Raymond Road
South Park Street
Wright Street
30 Minute Travel Time
Notes:
Accessible areas are based on the shortest travel time from the points shown leaving between 11 am and 1 pm.
Walking distances are straight-line paths regardless of the pedestrian network and obstacles that may exist and cannot exceed 1/4 mile.
Travel times are based on Metro Transit bus schedules effective August 28, 2016, not including supplemental Sunday service.
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Miles
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Figure: B-16

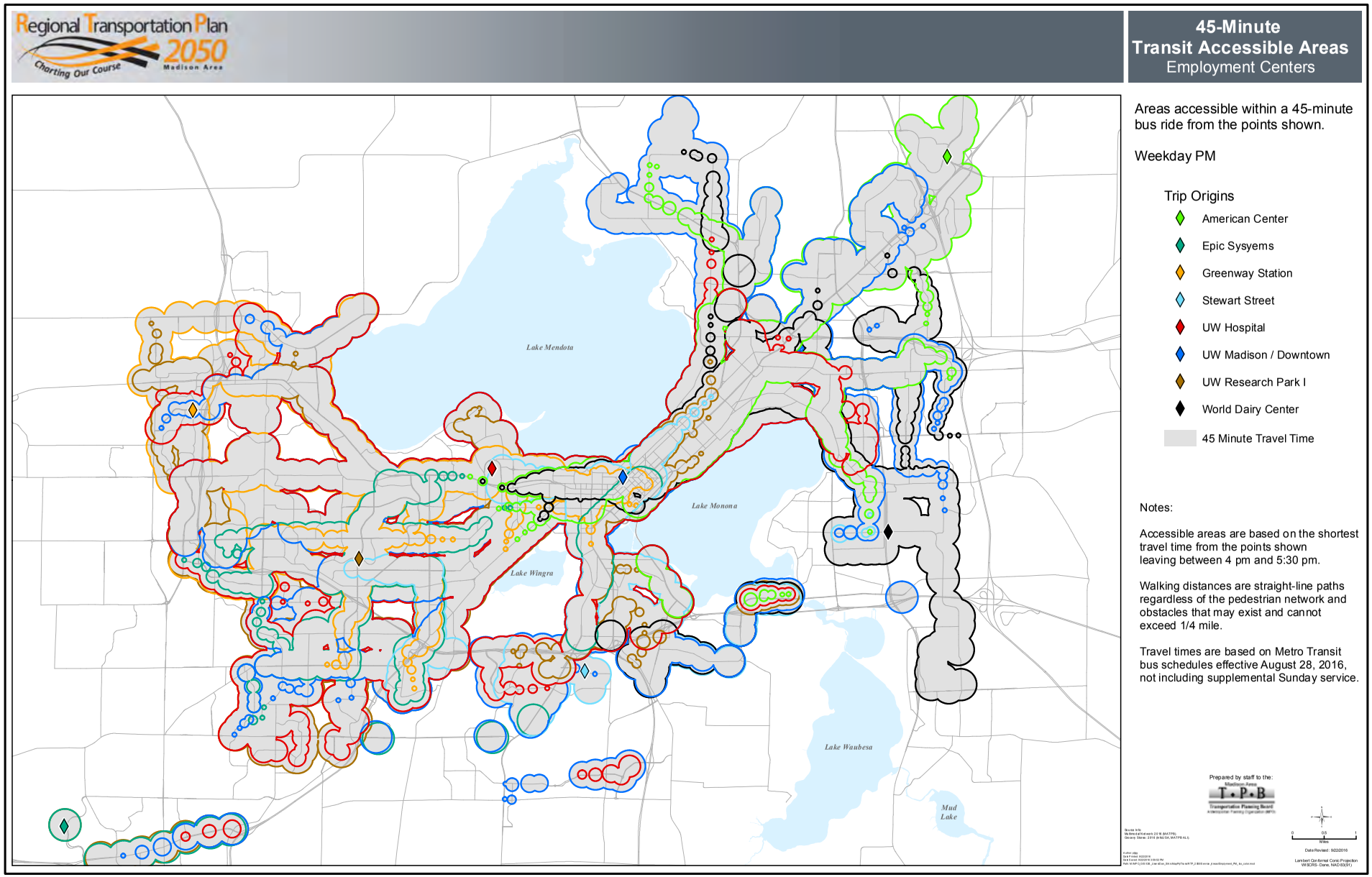

Regional Transportation Plan 2050
Charting Our Course
Madison Area
45-Minute
Transit Accessible Areas
Employment Centers
Areas accessible within a 45-minute bus ride from the points shown.
Weekday PM
Trip Origins
American Center
Epic Sysyems
Greenway Station
Stewart Street
UW Hospital
UW Madison / Downtown
UW Research Park I
World Dairy Center
45 Minute Travel Time
Notes:
Accessible areas are based on the shortest travel time from the points shown leaving between 4 pm and 5:30 pm.
Walking distances are straight-line paths regardless of the pedestrian network and obstacles that may exist and cannot exceed 1/4 mile.
Travel times are based on Metro Transit bus schedules effective August 28, 2016, not including supplemental Sunday service.
Lake Mendota
Lake Monona
Lake Wingra
Lake Waubesa
Mud Lake
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Figure: B-17

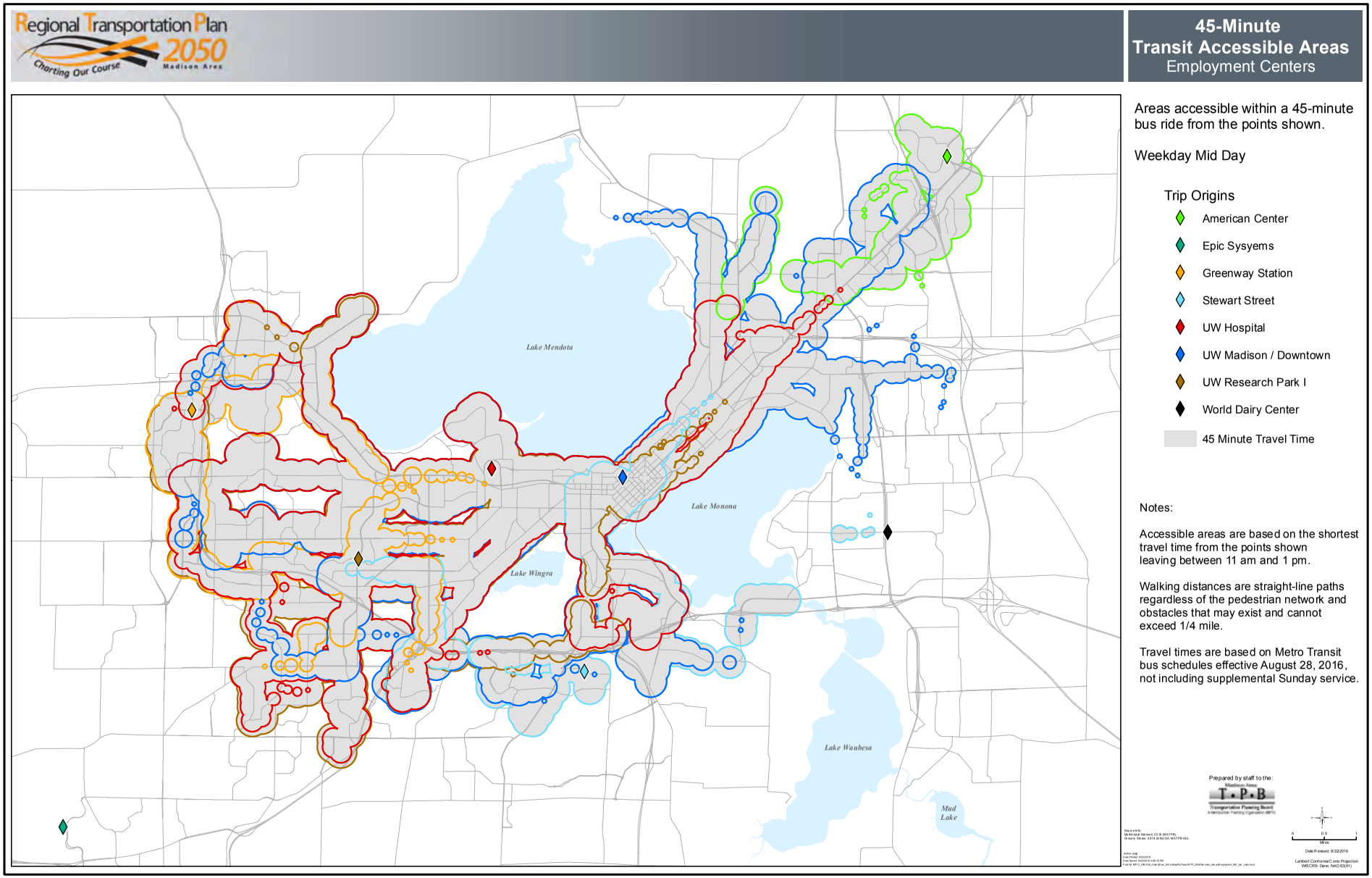
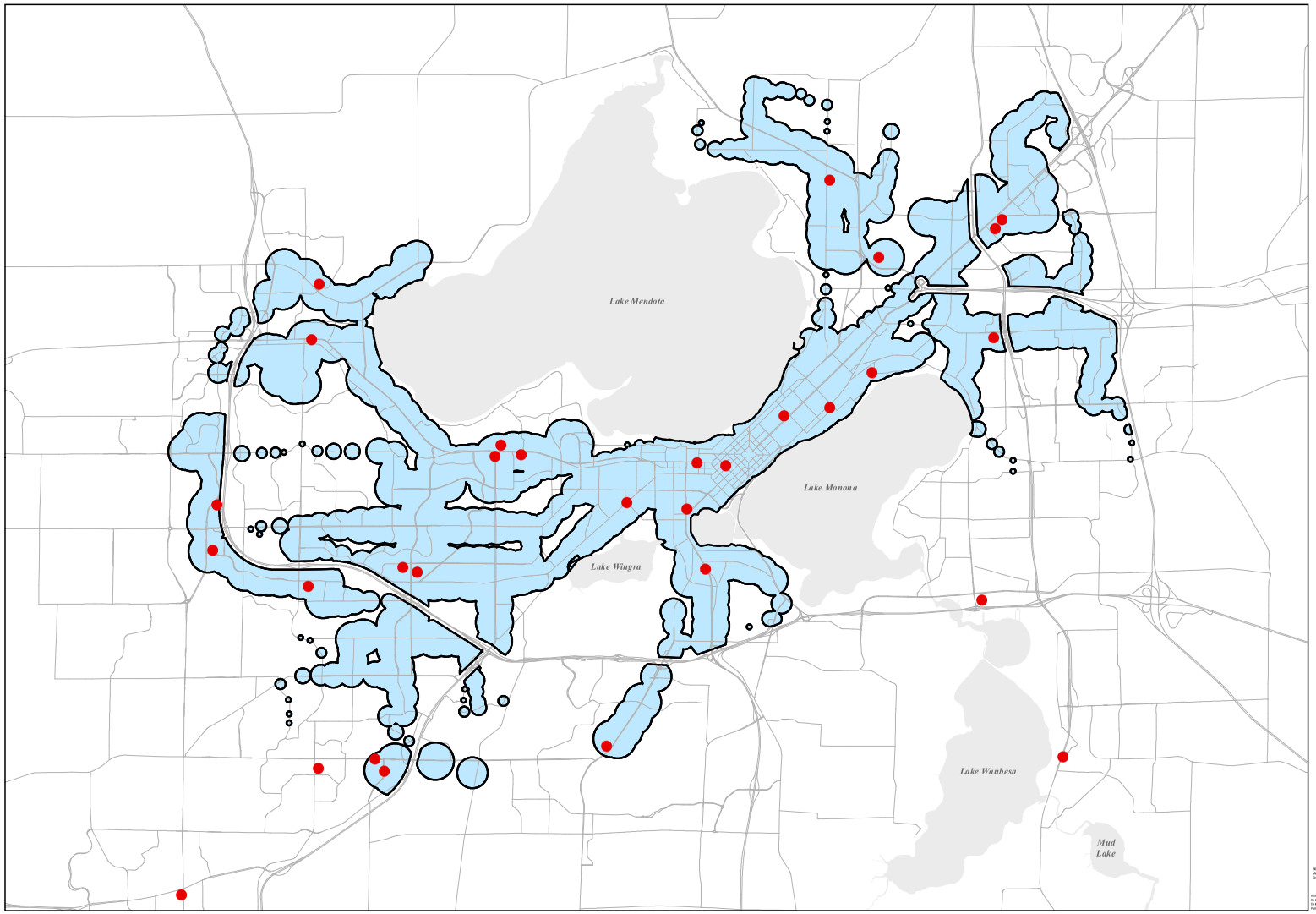

Regional Transportation Plan 2050
Charting Our Course
Madison Area
45-Minute
Transit Accessible Areas
Employment Centers
Lake Mendota
Lake Monona
Lake Wingra
Lake Waubesa
Mud Lake
Areas accessible within a 45-minute bus ride from the points shown.
Weekday Mid Day
Trip Origins
American Center
Epic Sysyems
Greenway Station
Stewart Street
UW Hospital
UW Madison / Downtown
UW Research Park I
World Dairy Center
45 Minute Travel Time
Notes:
Accessible areas are based on the shortest travel time from the points shown leaving between 11 am and 1 pm.
Walking distances are straight-line paths regardless of the pedestrian network and obstacles that may exist and cannot exceed 1/4 mile.
Travel times are based on Metro Transit bus schedules effective August 28, 2016, not including supplemental Sunday service.
Prepared by staff to the:
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Figure: B-18

Regional Transportation Plan 2050
Madison Area
Charting Our Course

15-Minute Transit Accessible Areas
Grocery Store



Areas accessible within a 15-minute bus ride from the points shown.

Saturday

- Full Service Grocery Store
- 15 Minute Travel Time

Notes:

Accessible areas are based on the shortest travel time from the points shown leaving between 11 am and 1 pm.

Walking distances are straight-line paths regardless of the pedestrian network and obstacles that may exist and cannot exceed 1/4 mile.

Travel times are based on Metro Transit bus schedules effective August 28, 2016, not including supplemental Sunday service.

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0 0.5 1 Miles

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Figure: B-19

Prairie. The all-day service to peripheral neighborhoods will allow lower income households that are more transit dependent to be able to live in these areas, some of which will be more affordable than many closer in neighborhoods.

Regional express service between Madison and its suburban neighbors will primarily serve individuals with mid-level incomes who work conventional work hours in central Madison. However, the service will also potentially serve lower income workers and people who live in Madison and commute to employment areas in the suburbs.

Overall, the public transit recommendations will not only expand the coverage of public transit, but it will reduce travel times for people using the bus. As illustrated by Figures 5-3 and 5-4, the improvements will vastly increase access to jobs via transit for residents of the region. As noted in the financial analysis in Chapter 6, however, additional funding – mostly likely through a new dedicated funding source such as an RTA with ability to levy a sales tax – will be required to implement most of these recommendations, including the full planned BRT system.

Conclusion

One of the seven RTP goals is improving equity for users of the transportation system. Accomplishing this goal requires providing convenient, affordable transportation options and making sure that the benefits of RTP investments are fairly distributed and do not disproportionately impact minority and low-income populations in a negative way. This EJ analysis has demonstrated that this is case for the RTP. Implementation of the RTP recommendations will provide more convenient and safe transportation options for people. In addition, there are numerous planned roadway preservation, transit, and bicycle/pedestrian facilities and services that will directly benefit neighborhoods with a concentration of EJ population groups. The needs of these neighborhoods have been considered in developing the RTP recommendations.

It should be noted that the EJ analysis conducted for the RTP is just a small part of ongoing efforts by the MPO, WisDOT, and local units of government to comply with Title VI and address environmental justice. More in-depth EJ analyses are being or will be conducted as part of ongoing and planned corridor studies (e.g., Stoughton Road/US 51 and the Beltline). The MPO includes environmental justice as one of the criteria in selecting projects for funding with program funds the MPO controls. The MPO also conducts an EJ analysis of the five-year Transportation Improvement Program (TIP) each year as part of the annual update. Also, implementing agencies conduct EJ analyses as individual projects move forward through the environmental analysis and design stages.

APPENDIX C: ENVIRONMENTAL ANALYSIS

Introduction

The Fixing America's Surface Transportation (FAST) Act, the current federal transportation bill, and implementing rules governing the development of metropolitan or regional transportation plans include environmental consultation and mitigation requirements. The requirements were first added under a prior bill, SAFETEA-LU, and have been continued under MAP-21 and now the FAST Act. Specifically, MPOs are required to consult with federal, state and county environmental and historic/cultural resource agencies in development of the regional transportation plan. The consultation is to include comparison of the transportation plan with conservation and environmental protection plans and inventories of natural and historic resources.

Regional transportation plans are also required to include a discussion of potential environmental mitigation strategies, policies, and actions that, over time, will serve to avoid, minimize, or compensate for (by replacing or providing substitute resources) the impacts to or disruption of the human and natural environment associated with implementation of the plan. The strategies are intended to be regional in scope, even though the mitigation may address potential project-level impacts.

The objective of these requirements is to strengthen the linkage between regional transportation planning and the project development and associated environmental analysis process required by the National Environmental Policy Act (NEPA) by:

1. Improving accountability for the natural and human environment in transportation planning and decision making; and
2. Improving understanding and respect for the comprehensive system level analysis and public decision making that occurs during the transportation planning process as the foundation for individual project purpose and need during project development under the NEPA process.

Environmental Resources Inventory

A comprehensive, up-to-date inventory of environmental resources and plans was prepared with assistance from the state resource agencies, Dane County Planning Department staff, and Capital Area Regional Planning Commission (CARPC) staff. Geographic information system (GIS) databases of the resources were mapped in relation to proposed capacity expansion projects and major transportation studies that might lead to such proposed projects. The resource inventory databases and maps provide a baseline of existing conditions for later use during project scoping and environment assessment as required by NEPA. In the meantime, they allow an initial environmental screening of planned transportation projects to be conducted to identify any that has the potential to negatively impact the natural and built environment. The resource plans and maps were also used to ensure that the composite local plans land use scenario used for developing the transportation plan was consistent with these plans.

The resource inventory was compiled from the following plans and databases:

- Dane County Water Quality Plan – This is the official area-wide water quality management plan for the county.[1] The purpose of the plan is to provide a policy framework and guidance for federal, state, and local water quality protection programs in the county. Area-wide water quality management plans are required to address the relationship of water quality to land and water resources and uses, to include existing and projected land use patterns and delineation of sewer service areas, and to delineate areas that should not be developed or disturbed because of resource value or environmental or physical constraints (Wis. Administrative Rule NR 121).

  The water quality plan incorporates and is based on adopted regional land use and development plans, including the Dane County Land Use & Transportation Plan and the Dane County Farmland Preservation Plan. The plan has 11 technical

[1] Dane County is also included in the water quality management plans for major river basins, which are prepared by WisDNR as part of the statewide continuing water quality management planning process. Basin water quality plans applicable to Dane County include those for the Lower Wisconsin River Basin, the Sugar River-Pecatonica River Basin, and the Upper and Lower Rock River Basins (which include the Yahara River, Koshkonong Creek, and the Maunesha River Watersheds). The intent and objective is consistency and mutual support between the Dane County Water Quality Plan and the applicable basin plans.

appendices and has been continually updated and expanded since it was certified by the state in 1979. The plan is included in the water quality management plans for four major river basins prepared by the Wisconsin Department of Natural Resources (WisDNR) as part of the statewide water quality management planning process.

- Dane County Comprehensive Plan (2007) – This plan was developed in accordance with the state's "Smart Growth" legislation and includes nine elements, including one on Agricultural, Natural, and Cultural Resources. The plan is intended to provide an overall "umbrella" framework for planning in the county, at the same time covering gaps in existing plans. It is intended to support, not supplant, other planning efforts. Other plans such as Water Quality Plan are incorporated by reference.

- Dane County Parks & Open Space Plan 2012-2017 – The plan, which is updated every five years, seeks to identify significant cultural, historical, and natural resources that should be considered for possible protection, preservation, or restoration. The plan also seeks to identify recreation needs and the county's role in providing facilities to meet anticipated demands.

- Dane County Land and Water Resources Management Plan – Prepared by the county's Land Conservation Department (LCD) staff with assistance from partner agencies, this plan addresses soil and water quality concerns using local, state, and federal programs. It is a five-year (2008-2013) action and implementation plan that emphasizes cooperation with conservation partners in the county, and is intended to complement and coordinate with existing plans.

- Dane County Farmland Preservation Plan – The plan, which was adopted in 1981, includes goals and policy statements and recommendations for specific elements that should be included in local town plans. Town plans, which are developed locally and adopted by the Dane County Board, are part of the county plan. These plans include a planned land use map specifying agricultural preservation areas and potential development areas and are used as criteria for zoning recommendations. Some city and village plans are also incorporated. The plan guides the administration of the county's farmland preservation program. This state program provides income tax credits to farm owners if the land is zoned for exclusive agricultural use. Twenty-nine towns have adopted the county's exclusive agricultural zoning.

- Agricultural Land Evaluation Database – The database was created from an agricultural land evaluation system developed by the Natural Resources Conservation Service with cooperation from the Dane County Land Conservation Department. The system is a component of the Dane County Land Evaluation Site Assessment (LESA) system, and uses three factors to rate the soil-based qualities of a site for agricultural use. The three factors, which are used to determine a numeric land evaluation (LE) rating, are:
  - Classification as prime farmland (weighted 10%)
  - Soil productivity for corn and alfalfa (45%)
  - Land capability class (45%)

  Town and county boards use combined LESA standards to evaluate development proposals, site plans, and rezoning applications to minimize impact to agricultural resources.

- Wisconsin Land Legacy Report – This 2006 WisDNR report includes a statewide assessment and description of the places identified as most important to meet the state's conservation and recreation needs for the next 50 years. It is intended as an educational resource and a source to reference when making land use decisions. It does not identify how or when the identified places should be protected or who should help protect them. Eleven of the 229 places identified statewide are at least partially in Dane County. They include (in alphabetical order):
  - Arlington Prairie

  - Black Earth Creek
  - Blue Mound-Blanchardville Prairie and Savanna
  - Blue Mound State Park
  - Crawfish River-Waterloo Drumlins
  - Dunn-Rutland Savanna and Potholes
  - Lower Wisconsin Riverway
  - Patrick Marsh
  - Shoveler Lakes-Black Earth Trench
  - Sugar River
  - Upper Yahara River and Lakes

- Wisconsin Wildlife Action Plan – This WisDNR plan, also known as the comprehensive Wildlife Conservation Plan, presents priority conservation actions to the native wildlife species of greatest conservation need and their habitats. It sets priorities for use of federal and state wildlife funds and provides guidance and information, including a reference database, for government agencies and others to support their conservation efforts.

- Wisconsin Natural Heritage Program Inventory – Maintained by WisDNR, this program maintains data on the locations and status of rare species, natural communities, and natural features in the state. The information is entered into an electronic database and locations marked on base maps. Exact locations are not published as this may threaten a resource, but the information is shared to facilitate protection and avoid impacts to rare resources. According to the inventory, the county provides habitat for 72 endangered or threatened terrestrial plant and animal species, and includes occurrences of 14 threatened or endangered natural communities. Federally listed plant species in Dane County include hill's thistle, prairie bush clover, eastern prairie white fringed orchid, and hall's bulrush. Federally listed animal species include henslow's sparrow, black tern bird, higgins eye pearly mussel, loggerhead shrike bird, northern long-eared bat, sheepnose mussel, and eastern massasauga rattlesnake.

- Aquatic & Terrestrial Resources Inventory – WisDNR maintains this statewide database, which was developed in order to provide agency staff and partners with environmental information to use in landscape-scale decision-making.

- Wisconsin Historic Preservation Database –The Wisconsin Historical Society maintains this GIS database of archaeological sites and surveys and historic properties. This inventory lists over 10,000 existing buildings of historic interest within the county. Access to this database is available through an online subscription, single use GIS data sets, and a public terminal in the State Historic Preservation Office.

- Wisconsin's Outstanding and Exceptional Resource Waters (O/ERW) – This WisDNR dataset is designed to include the cleanest waters in Wisconsin. An outstanding resource water is a lake, stream or flowage with excellent water quality, high recreational and aesthetic value and high quality fishing. These waters are free from point or nonpoint source pollution. Exceptional resource waters exhibit the same qualities as outstanding waters but may be affected by point source pollution or have the potential for future discharge from a small sewer community.

- Wisconsin Wetlands Inventory – This inventory was established in 1978 and completed in 1984 by the WisDNR to help protect wetlands. The inventory includes the type, size and location of the wetlands which are defined as an area where water is at, near, or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which has soils indicative of wet conditions.

Environmental Assessment

Figures C-1 to C-6 show the location of programmed and planned roadway capacity expansion projects and current and future major roadway and transit corridor studies in relation to the county's agriculture, natural, recreational, and historic/cultural resources. The maps were created from a GIS database developed from the resource inventories and plans listed and described above.

Figure C-1, Major Roadway and High Capacity Transit Improvements and Studies shown with Agricultural Land, shows the agricultural land evaluation rating of all undeveloped lands in the county based on the assessment system described above that rates the soil-based qualities of a site for agricultural use. The ratings are separated into eight groups with Group I being the best soils for agriculture. According to the USDA Census of Agriculture, Dane County had a total of 2,749 farms in 2012 with a combined total of 504,420 acres of farmland – a 6% decline in acreage from 2007. The total market value of Dane County's agricultural products exceeded $471 million – the highest of any county in the state and in the top 4% among all counties nationwide.

Figure C-2, Major Roadway and High Capacity Transit Improvements and Studies shown with Woodlands and Stream Water Assessments, shows outdoor recreation areas (including state, county, and local parks, etc.), woodlands, unprotected grassland areas and native prairie and savanna remnants, and stream water assessments.

Figure C-3, Major Roadway Projects and High Capacity Transit Improvements and Studies shown with Parks and Open Space, shows public and Native American lands, steep slopes, natural resource areas, water bodies, streams, and environmental/open space corridors. The natural resource areas include lands containing valuable natural resources or greenbelt corridors identified through a public process as part of development of the Dane County Parks and Open Space Plan. The environmental/open space corridor system is based on the recognition of the interrelatedness of adjacent landscape types and the importance of protecting valuable ecological units and linkages. The corridor system is therefore primarily associated with stream valleys and water features. The corridors include two distinct components: urban environmental corridors within urban service areas (USAs) and rural resource protection areas outside USAs. The urban environmental corridors are a continuous open space network based on natural features and environmental lands such as streams, lakes, shorelands, floodplains, wetlands, steep slopes, woodlands, parks, and publicly owned lands. The rural resource protection areas are based primarily on floodplains, wetlands and shoreland areas together with existing or proposed publicly owned or controlled lands needed for resource protection, continuity, or public recreation. The two corridor elements combine to provide a continuous countywide network of open spaces and environmental resources considered to be the most critical for protection.

Figure C-4, Major Roadway and High Capacity Transit Improvements and Studies shown with Wetlands, Hydric Soils, and Aquatic Life in Streams, shows wetlands, hydric soils, and warm and cold water fisheries based on WisDNR's stream classification system. Hydric soils include soils developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic vegetation. As such, they are potential wetland restoration sites. A combination of the hydric soil, hydrophytic vegetation, and hydrology criteria defines wetlands. Locating hydric soils assists in conservation planning, assessment of potential wildlife habitat, and overall land use planning.

Figure C-5, Major Roadway and High Capacity Transit Improvements and Studies shown with Rare Species, Floodplains, and Resource Waters, shows those PLSS sections in the county within which aquatic and/or terrestrial rare or threatened species are located according to the Wisconsin Natural Heritage Program Inventory. Exact locations are not published in order to protect the resources. Also shown are the 100-year floodplains defined by FEMA and resource waters based on WisDNR's stream classification system. The stream classification system is based on aquatic organisms and was established by WisDNR under chapter NR 102 of the state Administrative Code. Both Outstanding Resource Waters (ORWs) and Exceptional Resource Waters (ERWs) are listed in the code.

Figure C-6, Major Roadway and High Capacity Transit Improvements and Studies shown with Historical Sites, shows historical sites

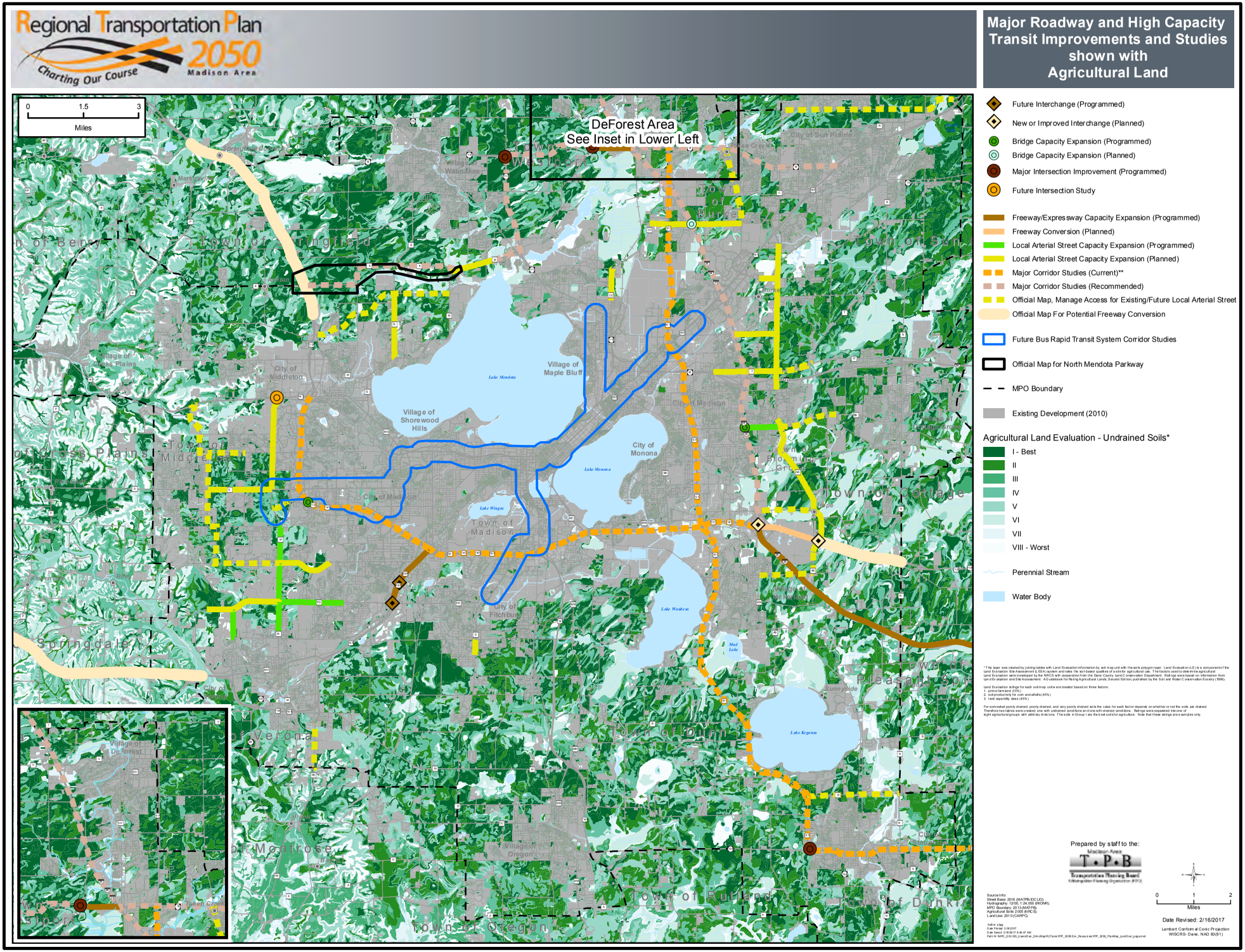

Regional Transportation Plan 2050
Madison Area
Charting Our Course
Major Roadway and High Capacity Transit Improvements and Studies shown with Agricultural Land
0 1.5 3
Miles
DeForest Area
See Inset in Lower Left
Future Interchange (Programmed)
New or Improved Interchange (Planned)
Bridge Capacity Expansion (Programmed)
Bridge Capacity Expansion (Planned)
Major Intersection Improvement (Programmed)
Future Intersection Study
Freeway/Expressway Capacity Expansion (Programmed)
Freeway Conversion (Planned)
Local Arterial Street Capacity Expansion (Programmed)
Local Arterial Street Capacity Expansion (Planned)
Major Corridor Studies (Current)**
Major Corridor Studies (Recommended)
Official Map, Manage Access for Existing/Future Local Arterial Street
Official Map For Potential Freeway Conversion
Future Bus Rapid Transit System Corridor Studies
Official Map for North Mendota Parkway
MPO Boundary
Existing Development (2010)
Agricultural Land Evaluation - Undrained Soils*
I - Best
II
III
IV
V
VI
VII
VIII - Worst
Perennial Stream
Water Body
Village of Maple Bluff
Village of Shorewood Hills
City of Monona
City of Middleton
Lake Mendota
Lake Monona
Lake Wingra
Lake Waubesa
Lake Kegonsa
Mud Lake
Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board
0 1 2
Miles
Date Revised: 2/16/2017
Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Figure: C-1

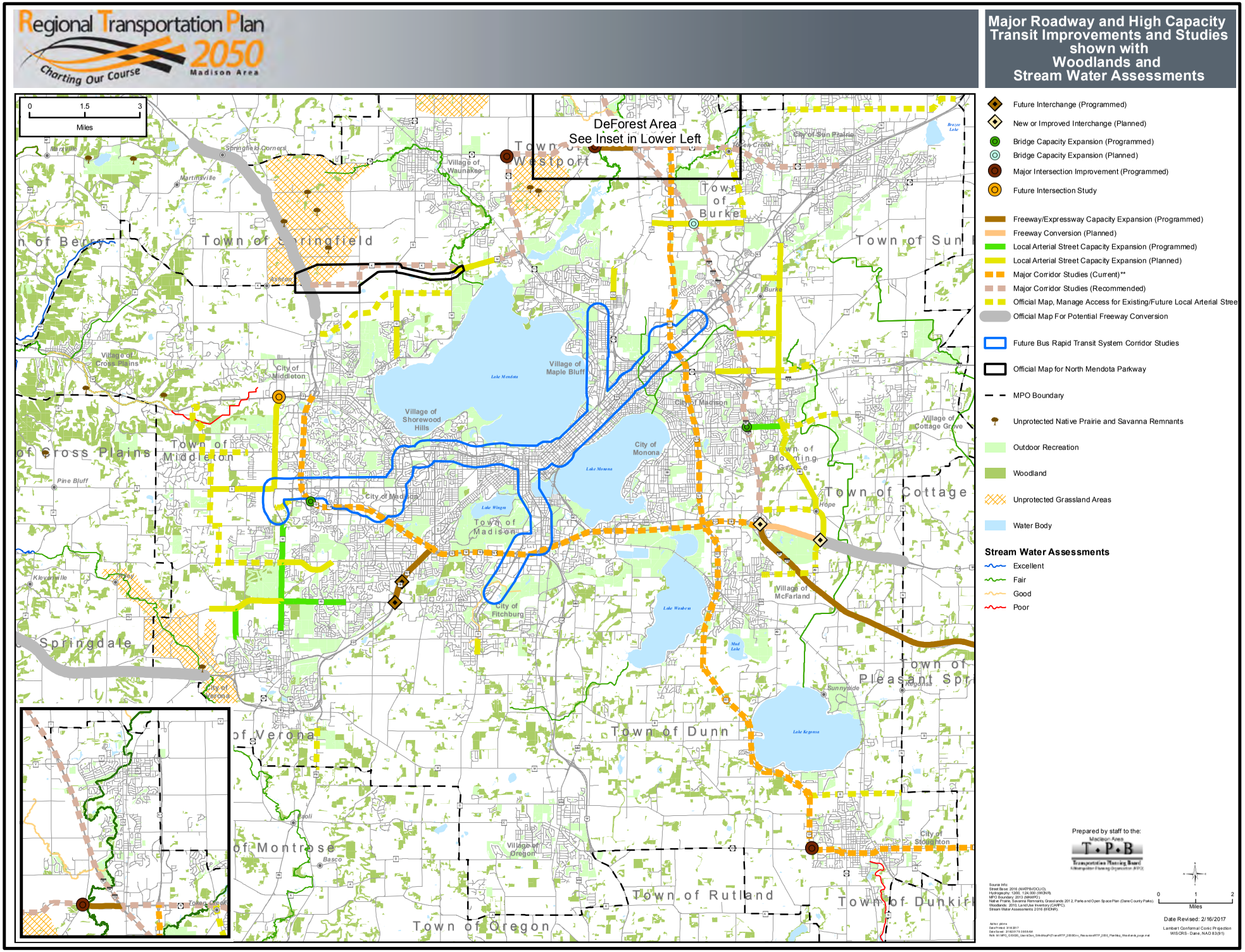

Regional Transportation Plan 2050
Charting Our Course
Madison Area
Major Roadway and High Capacity Transit Improvements and Studies shown with Woodlands and Stream Water Assessments
0 1.5 3
Miles
DeForest Area
See Inset in Lower Left
Future Interchange (Programmed)
New or Improved Interchange (Planned)
Bridge Capacity Expansion (Programmed)
Bridge Capacity Expansion (Planned)
Major Intersection Improvement (Programmed)
Future Intersection Study
Freeway/Expressway Capacity Expansion (Programmed)
Freeway Conversion (Planned)
Local Arterial Street Capacity Expansion (Programmed)
Local Arterial Street Capacity Expansion (Planned)
Major Corridor Studies (Current)**
Major Corridor Studies (Recommended)
Official Map, Manage Access for Existing/Future Local Arterial Stree
Official Map For Potential Freeway Conversion
Future Bus Rapid Transit System Corridor Studies
Official Map for North Mendota Parkway
MPO Boundary
Unprotected Native Prairie and Savanna Remnants
Outdoor Recreation
Woodland
Unprotected Grassland Areas
Water Body
Stream Water Assessments
Excellent
Fair
Good
Poor
Town of Westport
Town of Springfield
Town of Burke
Town of Sun
Town of Middleton
Town of Madison
Town of Cottage
Town of Dunn
Town of Pleasant Spr
Town of Rutland
Town of Dunkirk
Town of Oregon
Village of Waunakee
Village of Maple Bluff
Village of Shorewood Hills
City of Middleton
City of Monona
City of Madison
Village of Cottage Grove
Village of Cross Plains
City of Fitchburg
Village of McFarland
City of Verona
City of Stoughton
Village of Oregon
Lake Mendota
Lake Monona
Lake Wingra
Lake Waubesa
Lake Kegonsa
Prepared by staff to the:
Madison Area Transportation Planning Board
0 1 2
Miles
Date Revised: 2/16/2017
Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

Figure: C-2

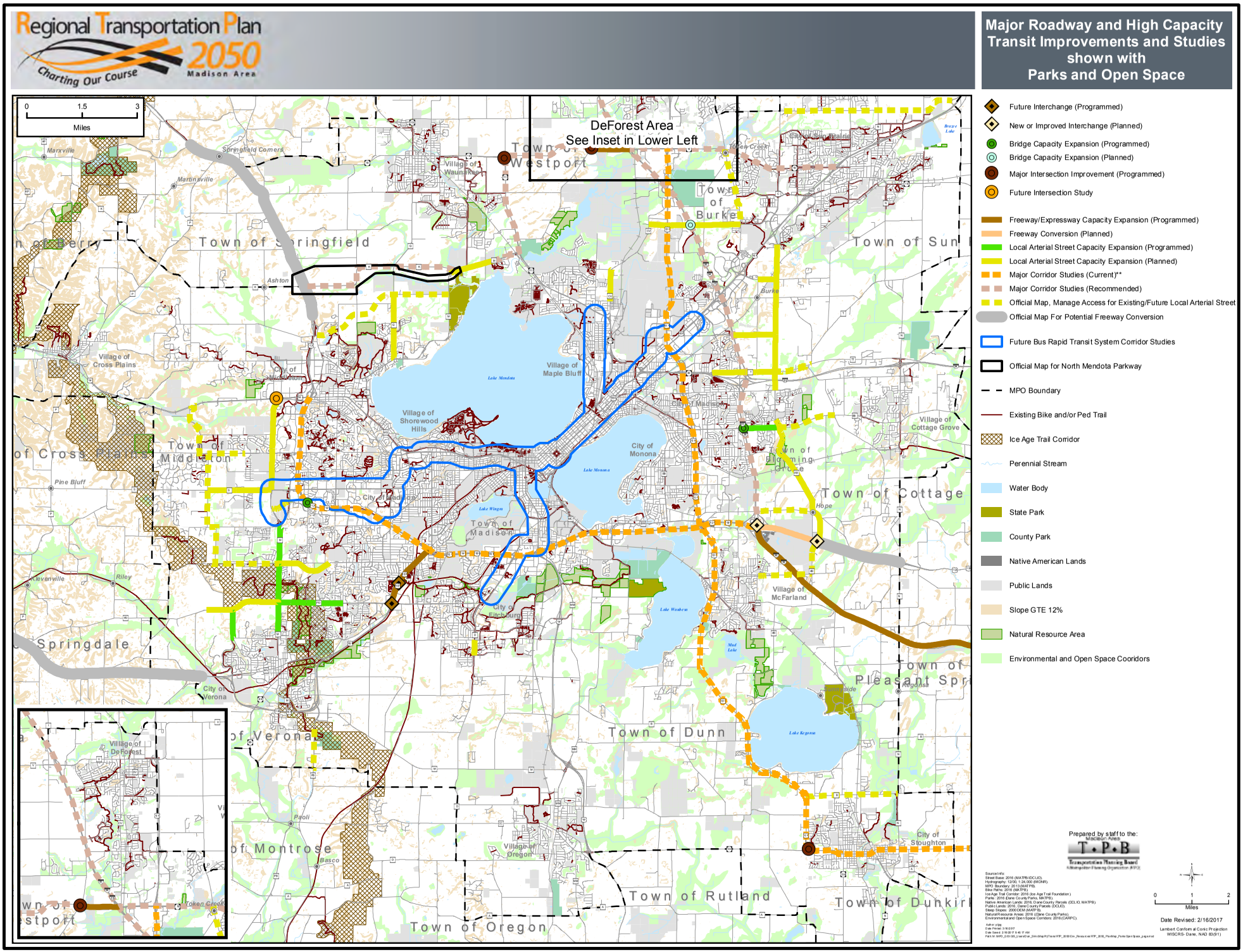

Regional Transportation Plan 2050
Charting Our Course
Madison Area
Major Roadway and High Capacity Transit Improvements and Studies shown with Parks and Open Space
DeForest Area
See Inset in Lower Left
0 1.5 3
Miles
Future Interchange (Programmed)
New or Improved Interchange (Planned)
Bridge Capacity Expansion (Programmed)
Bridge Capacity Expansion (Planned)
Major Intersection Improvement (Programmed)
Future Intersection Study
Freeway/Expressway Capacity Expansion (Programmed)
Freeway Conversion (Planned)
Local Arterial Street Capacity Expansion (Programmed)
Local Arterial Street Capacity Expansion (Planned)
Major Corridor Studies (Current)**
Major Corridor Studies (Recommended)
Official Map, Manage Access for Existing/Future Local Arterial Street
Official Map For Potential Freeway Conversion
Future Bus Rapid Transit System Corridor Studies
Official Map for North Mendota Parkway
MPO Boundary
Existing Bike and/or Ped Trail
Ice Age Trail Corridor
Perennial Stream
Water Body
State Park
County Park
Native American Lands
Public Lands
Slope GTE 12%
Natural Resource Area
Environmental and Open Space Cooridors
Prepared by staff to the:
Transportation Planning Board
Metropolitan Planning Organization (MPO)
Source Info:
Street Base: 2016 (MATPB/DCLIO).
Hydrographic: 12/30, 1:24,000 (WDNR).
MPO Boundary: 2013 (MATPB).
Bike Paths: 2016 (MATPB).
Ice Age Trail Corridor: 2016 (Ice Age Trail Foundation.)
Parks: 2016 (Dane County Parks, MATPB).
Native American Lands: 2016, Dane County Parcels (DCLIO, MATPB)
Public Lands: 2016, Dane County Parcels (DCLIO).
Steep Slopes: 2000 DEM (MATPB)
Natural Resource Areas: 2016 ((Dane County Parks).
Environmental and Open Space Corridors: 2016 (CARPC).
Author: jdg
Date Printed: 2/16/2017
Date Saved: 2/16/2017 9:40:17 AM
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0 1 2
Miles
Date Revised: 2/16/2017
Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)
Town of Springfield
Town of Westport
Town of Burke
Town of Sun Prairie
Town of Middleton
Town of Madison
Town of Cottage Grove
Town of Dunn
Town of Pleasant Springs
Town of Rutland
Town of Dunkirk
Town of Oregon
Town of Montrose
Village of Cross Plains
Village of Maple Bluff
Village of Shorewood Hills
City of Monona
Village of McFarland
City of Stoughton
City of Verona
Village of DeForest
Lake Mendota
Lake Monona
Lake Wingra
Lake Waubesa
Lake Kegonsa
Mud Lake
Marxville
Springfield Corners
Martinsville
Ashton
Pine Bluff
Riley
Springdale
Paoli
Basco
Token Creek
Hope

Figure: C-3

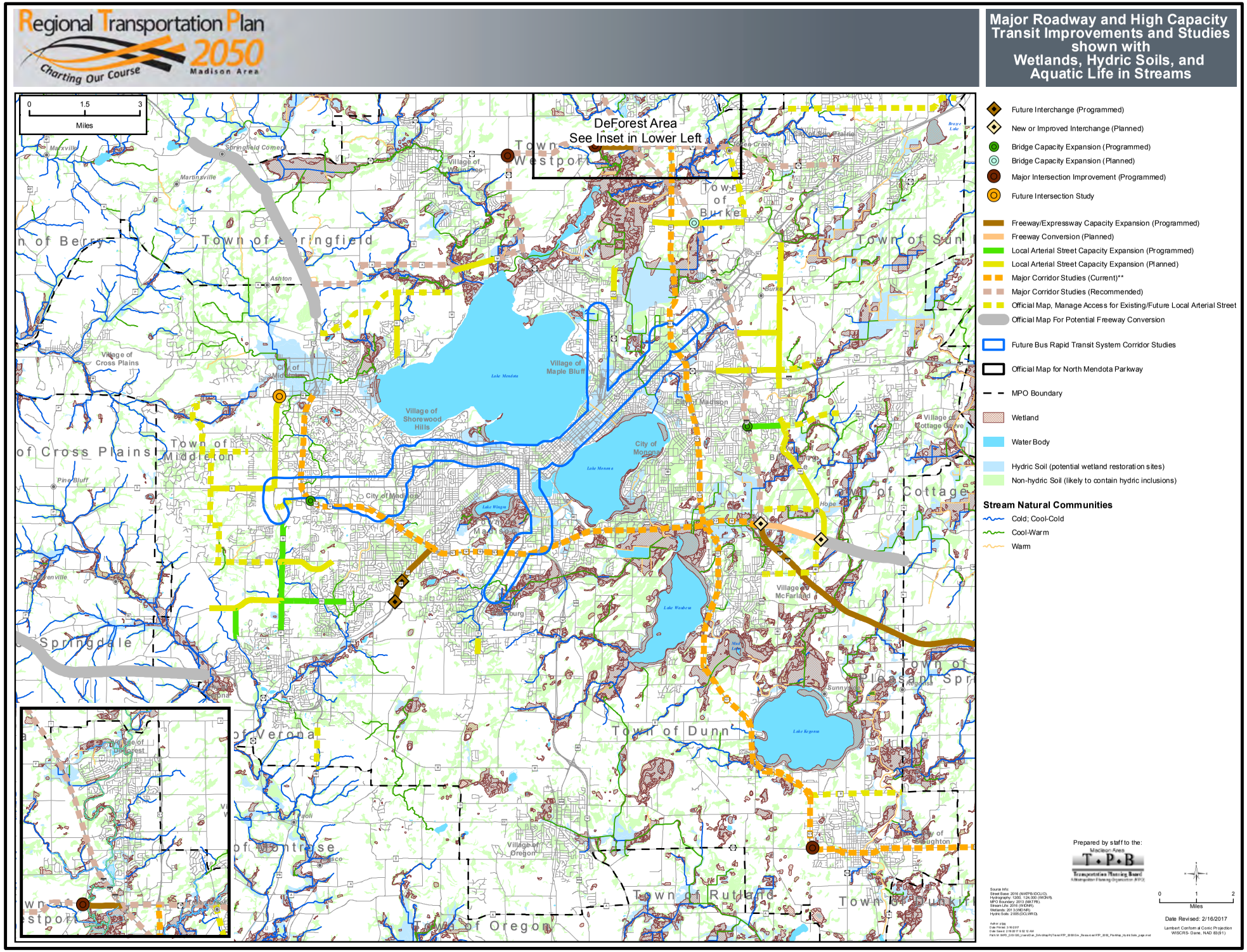

Regional Transportation Plan 2050
Charting Our Course
Madison Area
Major Roadway and High Capacity Transit Improvements and Studies shown with Wetlands, Hydric Soils, and Aquatic Life in Streams
DeForest Area
See Inset in Lower Left
0 1.5 3
Miles
Future Interchange (Programmed)
New or Improved Interchange (Planned)
Bridge Capacity Expansion (Programmed)
Bridge Capacity Expansion (Planned)
Major Intersection Improvement (Programmed)
Future Intersection Study
Freeway/Expressway Capacity Expansion (Programmed)
Freeway Conversion (Planned)
Local Arterial Street Capacity Expansion (Programmed)
Local Arterial Street Capacity Expansion (Planned)
Major Corridor Studies (Current)**
Major Corridor Studies (Recommended)
Official Map, Manage Access for Existing/Future Local Arterial Street
Official Map For Potential Freeway Conversion
Future Bus Rapid Transit System Corridor Studies
Official Map for North Mendota Parkway
MPO Boundary
Wetland
Water Body
Hydric Soil (potential wetland restoration sites)
Non-hydric Soil (likely to contain hydric inclusions)
Stream Natural Communities
Cold; Cool-Cold
Cool-Warm
Warm
Town of Westport
Town of Springfield
Town of Burke
Town of Middleton
Town of Cottage Grove
Town of Dunn
Town of Rutland
Town of Oregon
Village of Maple Bluff
Village of Shorewood Hills
Village of Cross Plains
Village of McFarland
Village of Oregon
City of Monona
City of Madison
Lake Mendota
Lake Monona
Lake Waubesa
Lake Kegonsa
Prepared by staff to the:
Madison Area T.P.B. Transportation Planning Board
0 1 2
Miles
Date Revised: 2/16/2017
Lambert Conformal Conic Projection
WISCRS Dane, NAD 83(91)

Figure: C-4

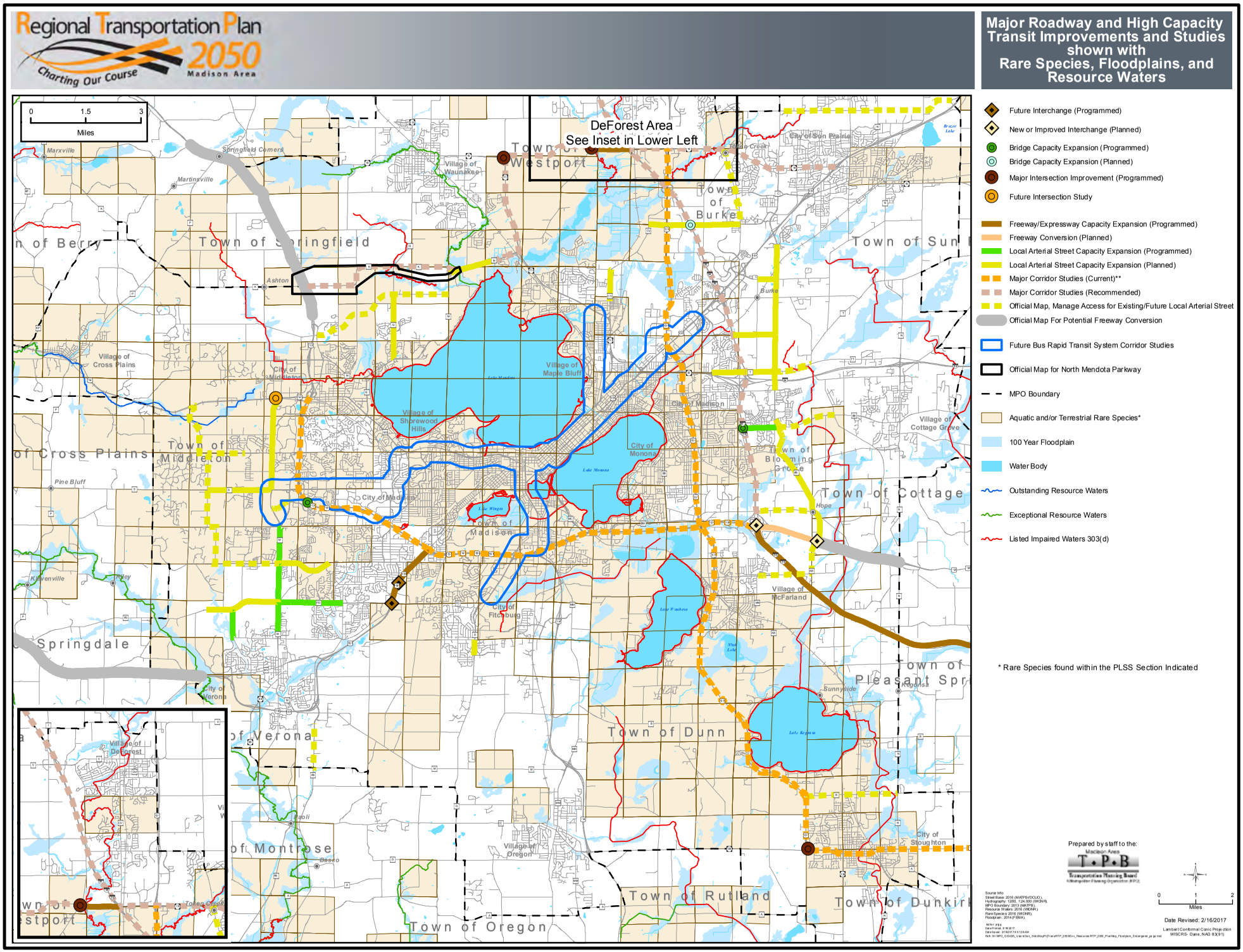

Regional Transportation Plan 2050
Charting Our Course
Madison Area
Major Roadway and High Capacity Transit Improvements and Studies shown with Rare Species, Floodplains, and Resource Waters
0 1.5 3
Miles
DeForest Area
See Inset in Lower Left
Future Interchange (Programmed)
New or Improved Interchange (Planned)
Bridge Capacity Expansion (Programmed)
Bridge Capacity Expansion (Planned)
Major Intersection Improvement (Programmed)
Future Intersection Study
Freeway/Expressway Capacity Expansion (Programmed)
Freeway Conversion (Planned)
Local Arterial Street Capacity Expansion (Programmed)
Local Arterial Street Capacity Expansion (Planned)
Major Corridor Studies (Current)**
Major Corridor Studies (Recommended)
Official Map, Manage Access for Existing/Future Local Arterial Street
Official Map For Potential Freeway Conversion
Future Bus Rapid Transit System Corridor Studies
Official Map for North Mendota Parkway
MPO Boundary
Aquatic and/or Terrestrial Rare Species*
100 Year Floodplain
Water Body
Outstanding Resource Waters
Exceptional Resource Waters
Listed Impaired Waters 303(d)
* Rare Species found within the PLSS Section Indicated
Prepared by staff to the:
Madison Area T.P.B. Transportation Planning Board
0 1 2
Miles
Date Revised: 2/16/2017
Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)
Town of Westport
Town of Springfield
Town of Burke
Town of Sun Prairie
Town of Cross Plains
Town of Middleton
Town of Madison
Town of Cottage Grove
Town of Dunn
Town of Pleasant Spr
Town of Verona
Town of Montrose
Town of Oregon
Town of Rutland
Town of Dunkirk
Village of Waunakee
Village of Maple Bluff
Village of Shorewood Hills
Village of Cross Plains
Village of Cottage Grove
Village of McFarland
Village of Oregon
Village of DeForest
City of Middleton
City of Monona
City of Madison
City of Fitchburg
City of Verona
City of Stoughton
Marxville
Springfield Corners
Martinsville
Ashton
Pine Bluff
Springdale
Hope
Sunnyside
Lake Mendota
Lake Monona
Lake Waubesa
Lake Kegonsa
Lake Wingra
Tonyn Creek
Bracco Lake
Source Info:
Street Base: 2016 (WATPB/DCLIO).
Hydrography: 1200, 124,000 (WICNR).
MPO Boundary: 2013 (WATPB).
Resource Waters: 2016 (WICNR).
Rare Species: 2016 (WICNR).
Floodplain: 2014 (FEMA).
Author: jdg
Date Printed: 3/16/17
Date Revised: 2/16/2017 8:13 AM
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Figure: C-5

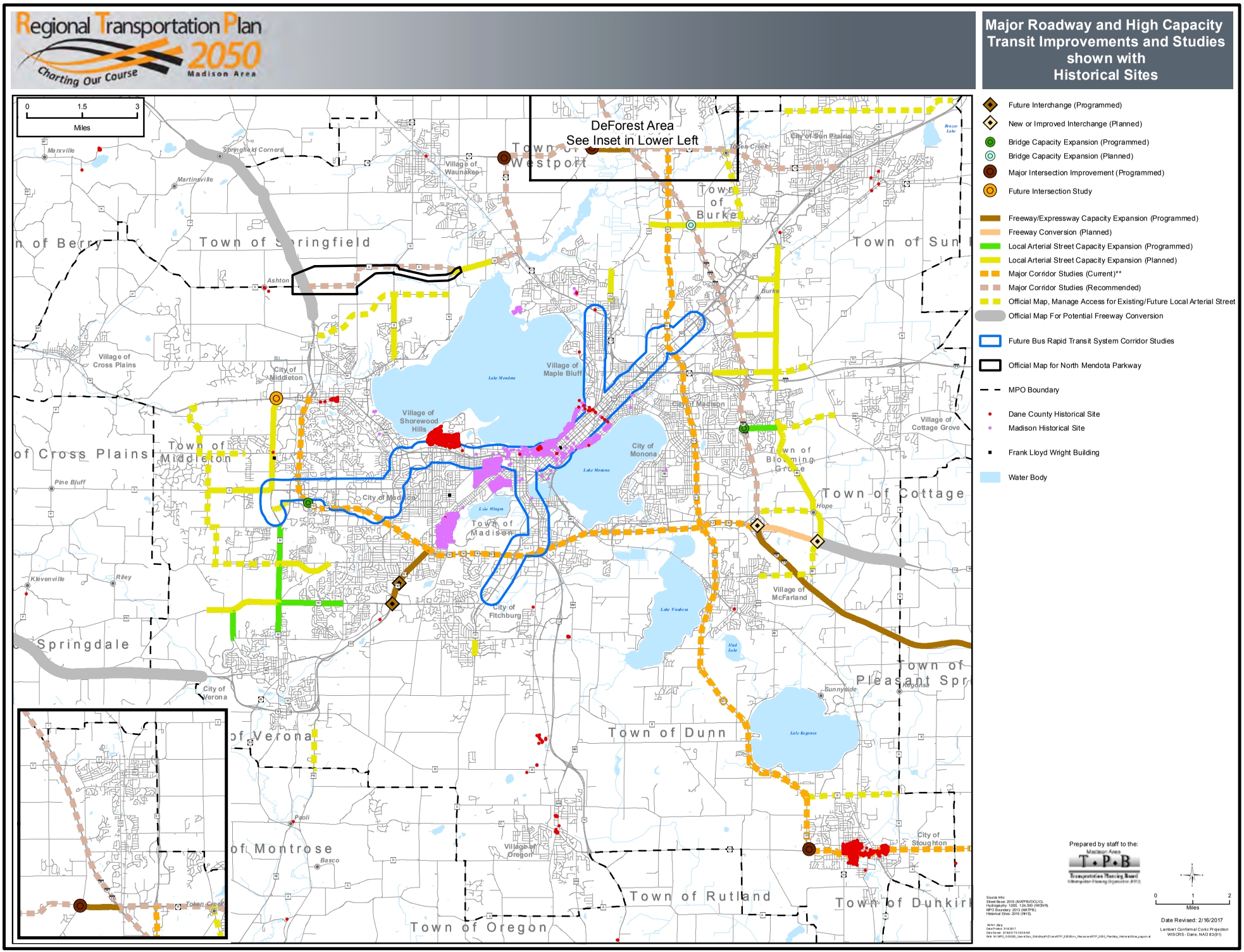

Regional Transportation Plan 2050
Charting Our Course
Madison Area
Major Roadway and High Capacity Transit Improvements and Studies shown with Historical Sites
DeForest Area
See Inset in Lower Left
0 1.5 3
Miles
Future Interchange (Programmed)
New or Improved Interchange (Planned)
Bridge Capacity Expansion (Programmed)
Bridge Capacity Expansion (Planned)
Major Intersection Improvement (Programmed)
Future Intersection Study
Freeway/Expressway Capacity Expansion (Programmed)
Freeway Conversion (Planned)
Local Arterial Street Capacity Expansion (Programmed)
Local Arterial Street Capacity Expansion (Planned)
Major Corridor Studies (Current)**
Major Corridor Studies (Recommended)
Official Map, Manage Access for Existing/Future Local Arterial Street
Official Map For Potential Freeway Conversion
Future Bus Rapid Transit System Corridor Studies
Official Map for North Mendota Parkway
MPO Boundary
Dane County Historical Site
Madison Historical Site
Frank Lloyd Wright Building
Water Body
Prepared by staff to the:
Madison Area T.P.B. Transportation Planning Board
0 1 2
Miles
Date Revised: 2/16/2017
Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)
Town of Springfield
Town of Middleton
Town of Dunn
Town of Rutland
Town of Oregon
Town of Verona
Town of Westport
Town of Burke
Town of Cottage Grove
Town of Pleasant Spr
Village of Cross Plains
Village of Maple Bluff
Village of Shorewood Hills
Village of Waunakee
Village of McFarland
Village of Oregon
City of Middleton
City of Madison
City of Monona
City of Fitchburg
City of Verona
City of Stoughton
City of Sun Prairie
Lake Mendota
Lake Monona
Lake Wingra
Lake Waubesa
Lake Kegonsa
Mud Lake
Ashton
Pine Bluff
Riley
Springdale
Hope
Sunnyside
Basco
Pool
Token Creek

Figure: C-6

identified by the Dane County Historical Society, Madison Historic Landmarks, and Research Sites. Buildings and sites on the State and National Registers of Historic Places are included.

The resource maps illustrate the sensitivity of the western, driftless part of the county. They also show the extensive amount of streams and wetlands in the Yahara River valley in the central part of the county and in the drumlin area in the eastern part of the county. The streams in the central and eastern parts of the county are flatter and more sluggish and fewer are spring-fed. Their water quality is affected by runoff from the extensive agricultural lands in these areas.

The environmental resource maps provide an overall picture of the location of environmentally sensitive areas in relation to proposed transportation improvements and corridor studies. The three transportation corridors with planned or potential projects that traverse the most sensitive areas are Buckeye Road (relocated Buckeye Road to US 12/18), Sprecher Road (Sharpsburg Drive to Buckeye Road), and the southern part of the North Mendota Parkway, which crosses Six Mile Creek in the northern part of the Yahara River Watershed. The southwestern segment of the North Mendota Parkway (west of the CTH M/CTH K intersection) is included in the plan at this time only as a study. An environmental study of this part of the corridor was conducted by Dane County to provide a general assessment of the impacts of a roadway through this corridor, identify the routing with the least environmental impact for official mapping, and also identify the boundaries of a planned E-Way, similar to the Lewis Nine Springs E-Way through Fitchburg. A specific route in the eastern part of the corridor between CTH M and CTH Q was identified while a broader area to the west over to US 12 was identified. The northeastern part of the parkway (WIS 19 between the Interstate and River Road) crosses the Yahara River and is also in a sensitive area. That segment is programmed for expansion to four lanes in conjunction with the replacement of the bridge over the Yahara River. The programmed CTH M (S. Pleasant View Road) (Valley View to Cross Country Road) project also has significant potential impacts based on this screening, however an environmental study for the project was just recently completed and approved.

In order to address growth management issues in the North Mendota Parkway Corridor, including potential indirect and cumulative impacts to environmental and agricultural resources, local communities in the corridor adopted a binding intergovernmental agreement that commits the communities to implementing the land use/transportation planning recommendations from the study. These include:

- Adoption of a transportation policy that provides for access control on all identified future collector roadways;
- Official mapping of the North Mendota E-Way to preserve open space system sites; and
- Adoption of a North Mendota Area Plan with a 50-year time horizon that includes a development plan map depicting development areas, permanent preservation areas (including sensitive environmental areas, farmland protection areas, and significant historic/cultural resources), and other "indefinite future areas."

Dane County and area communities adopted resolutions supporting the recommendations of the North Mendota Parkway Implementation Oversight Committee, which had been set up to identify the E-Way corridor and the roadway corridor. The E-Way or North Mendota Natural Resources Area was incorporated by the county into the 2012-2017 Dane County Parks and Open Space Plan. In part due to lack of funding for the roadway project, no further activities have been undertaken to implement the above recommendations.

Most of the plan's recommended major local arterial capacity expansion projects involve reconstruction of existing roadways to provide additional travel lanes rather than new roadways on new alignment. There are two projects that involve short segments of roadway on new alignment. A very short segment of the programmed Sprecher Road reconstruction project is on a new alignment to avoid a drumlin area and connect directly to CTH AB. A short segment of Raymond Road/MidTown Road (Muir Field Road to Jeffy Trail) will be reconstructed on a new alignment to provide a continuous east-west roadway. These local arterial projects are located in developing areas or in areas planned for future urban development within the next 30-35 years. None of these projects is of a scale or nature that would be expected to result in significant indirect and/or cumulative impacts to environmental or agricultural resources located outside these planned areas of development.

Environmental Screening of Projects

MPO staff conducted an environmental screening of programmed and planned capacity expansion roadway projects using the MPO's geographic information system (GIS) database. The purpose of this screening was to identify those projects that have the potential for negatively impacting the natural and built environment with the intent of preventing or minimizing such impacts. The environmental screening results also notify the MPO Policy Board, WisDOT, and local governments of possible environmental impacts associated with these improvements to the region's roadway system.

Following consultation with CARPC staff, the following environmental resources or features were chosen for the environmental screening:

- Best agricultural soils (based upon the agricultural land evaluation rating system)
- Wetlands and water bodies
- Environmental corridors
- Steep slopes
- Streams
- Parks and other recreational areas
- Tribal lands
- General location (PLSS section) where rare or threatened species have been located
- Historic properties
- DNR Managed Lands

Burial sites were not included in this analysis as the sites are not to be made public. However, they are a protected resource under section 157.70 of the Wisconsin Statutes and must be considered when evaluating potential projects.

There is overlap among the selected environmental features, since environmental corridors are based on natural features and environmental lands such as streams, lakes, floodplains, wetlands, steep slopes, woodlands, parks, and other publicly owned lands. However, it was decided to separately screen for some of these features since not all of them are included within environmental corridors. This ensured that the screening captured all potentially environmentally significant lands.

For the screening, buffers were assigned to the roadway projects. For roadway expansion projects, a buffer of 125 feet on either side of the roadway centerline was used, making for a 250- foot wide buffer overall. This is about twice the size of the typical 120-foot right of way used for a four-lane, divided urban street. The much wider buffer was used, because this was just a screening and areas outside the right of way could potentially be affected by construction activity and storm water runoff. A total buffer of 800 feet was used for proposed interchange and bridge projects.

Figure C-7 lists all of the programmed and planned capacity expansion projects and indicates those that appear to have one or more of the above-listed resources within the buffer zone of the project. The table includes programmed and planned capacity improvement studies, but the environmental resources within the study areas were not assessed. The table does not indicate the various levels of potential impacts (e.g., number of acres affected), but simply denotes an environmental feature's proximity to the proposed roadway project. This screening in no way eliminates the need for the project sponsor to complete an in-depth environmental assessment that meets the requirements of the NEPA and the Wisconsin Environmental Policy Act (WEPA), where applicable.

Many of the planned roadway projects are adjacent to at least one environmental resource or feature. Steep slopes and highly rated agricultural soils are the most common features falling within the buffers followed by rare species and environmental corridors. It should be noted that all of the impacted agricultural lands are in areas planned for future development, according

Figure C-7

Assessment of Potential Resource Impacts of Potential Roadway Capacity Expansion Projects

PROJECT			RESOURCE									
Facility	Segment	Est. Time Table	Best Ag. Soils	Wetlands/ Water Body	Envir. Corr.	Steep Slopes	Stream	Parks/ Rec. Facilities	Tribal Lands	Rare Species	Historic Properties	DNR Managed Lands
Programmed Projects and Studies												
Roadway Segments - State												
Verona Rd. (US 18/151)	Nakoma St. to Raymond Rd.	2017-2020				X				X		
Verona Rd. (US 18/151)	Raymond Rd. to McKee Rd./CTH PD	2017-2020				X				X		
WIS 19	River Rd. to Interstate 39/90	2017-2020	X	X	X	X	X	X		X		X
Roadway Segments - Local												
CTH M (S. Pleasant View Rd.)	Valley View Rd. to Cross Country Rd.	2017-2020	X	X	X	X		X		X		
Cottage Grove Rd. (CTH BB)	North Star Dr. to Sprecher Rd.	2017-2020				X						
McKee Rd. (CTH PD)	Meriter Way to Maple Grove Dr.	2017-2020			X	X		X		X		
Nine Mound Rd.	Cross Country Rd. to CTH PD	2017-2020				X						
Interchanges and Bridges												
W. Beltline (US 12/14)	S. High Point Rd. Bridge	2017-2020				X				X		
Interstate 39/90	Cottage Grove Rd. Bridge	2017-2020				X						
Verona Rd. (US 18/151)	Williamsburg Way, CTH PD Interchanges	2017-2020								X		
Major Studies - Capacity Improvements												
W. Beltline (US 12/14/18/151)	US 14 to CTH N	2017 -2024	PEL study concluding; EIS to follow.									
Interstate 39/90	Beltline interchange area	2017-2018	Includes US 12/18 from US 51 to CTH AB.									
US 51 (Stoughton Rd.)	Terminal Dr. to WIS 19	2017-2018	Ongoing.									
US 51	McFarland to Stoughton	2017-2018	Recommended alternative identified; mostly reconstruction with intersection improvements.									
Planned Projects												
Roadway Segments - State												
US 51	WIS 138 to CTH B	2021-2035										
Roadway Segments - Local												
Buckeye Rd. (CTH AB)	Relocated Sprecher Rd. to US 12/18	2036-2050	X	X	X	X	X	X				X
CTH D (Fish Hatchery Rd.)	Lacy Rd. to Nobel Dr.	2021-2035	X		X							
CTH M	Willow Rd. to CTH K	2021-2035	X	X	X		X	X		X		X
CTH PD	CTH M to West of Shady Oak Ln.	2021-2035	X		X	X						
CTH Q	Oncken Rd. to CTH M (Century Ave.)	2021-2035	X		X	X				X		
CTH T (Commercial Ave.)	N. Thompson Dr. to Reiner Rd.	2036-2050	X			X						
Hoepker Rd.	US 51 to Portage Rd.	2021-2035	X		X	X				X		
Hoepker Rd.	Portage Rd. to Rattman Rd./American Pkwy.	2021-2035	X		X							
Hoepker Rd.	US 51 to CTH CV	2021-2035				X				X		
Lien Rd.	City View Dr. to Felland Rd.	2021-2035	X			X						
Lien Rd. Extension	Felland Rd. to Reiner Rd.	2021-2035	X	X		X						
Mid town Rd.	Muir Field Rd. to CTH M (S. Pleasant View)	2036-2050	X		X	X				X		
Mineral Point Rd. (CTH S)	S. Pleasant View Rd. to Veritas Dr.	2021-2035	X			X				X		
Mineral Point Rd. (CTH S)	Veritas Dr. to Pioneer Rd.	2036-2050	X							X		
Nelson Rd.	High Crossing Blvd. to Reiner Rd.	2036-2050	X			X						
Packers Ave. (CTH CV)	Tennyson Ln. to Wheeler Rd.	2036-2050	X							X		
N. Pleasant View Rd.	US 14 to Greenway Blvd.	2021-2035			X	X				X		
N. Pleasant View Rd.	Greenway Blvd. to Timber Wolf Trail	2021-2035			X	X				X		
N. Pleasant View Rd.	Timber Wolf Trail to Mineral Point Rd.	2021-2035	X							X	X	
Reiner Rd.	O'Keeffe Ave. to Lien Rd. extended	2036-2050	X	X		X						
Reiner Rd.	Lien Rd. extended to CTH T	2036-2050	X									
Sprecher Rd.	CTH T to Milwaukee St.	2021-2035	X									
Sprecher Rd.	Sharpsburg Dr. to Buckeye Rd. (CTH AB)	2021-2035	X	X	X	X		X				
Watts Rd.	CTH M to Pleasant View Rd.	2021-2035	X			X				X		
Interchanges and Bridges												
Interstate 39/90	Beltline (US 12/18) Interchange (BIC)	2021-2035		X								
Interstate 39/90	Hoepker Rd. Bridge	2021-2035			X	X						
US 12/18	CTH AB Interchange		X									
Major Studies												
Interstate 39/90/94*	Beltline to I-90/94 split near Portage	Uncertain	Partly outside the MPO Planning Area.									
WIS 19/WIS 113/CTH M	US 12 to US 151	Uncertain										

* Indicates most of roadway segment located outside the Madison Metropolitan Planning Area.

to local land use plans. Additionally, steep slopes in some areas are attributed to project-related grading. Eight projects are adjacent to wetlands or water bodies; six are in the vicinity of parks or recreational facilities; three projects are adjacent to streams; three are in the vicinity of DNR Managed Lands; and one project is located adjacent to a historic property. None of the projects is adjacent to tribal land.

It should be emphasized that a detailed review of orthophoto maps showing the resource features and project buffers was not conducted. A cursory review of maps of the project buffers and resources was done in some cases (e.g., to determine the location of the resource within the project buffer where only a fraction of an acre was inside it). In addition, the scale of maps the MPO had of the alignment of those roadways on new alignment was not necessarily suitable for such a detailed analysis.

The screening was conducted to provide an early warning of those projects for which impacts to resources may need to be assessed further in order to mitigate possible negative impacts on the natural and built environment. The location of one or more environmental features within the buffer zone area may influence the design (e.g., width of median), alignment, timing, and/or cost of planned projects. The assessment does not prevent a project from moving forward, but identifies potential impacts that may need to be addressed as the project goes into the design and preliminary engineering phase.

Environmental Mitigation Strategies and Activities

Proposed roadway capacity expansion projects have been or are being developed through the regional transportation planning process to avoid, if at all possible, impacts to environmentally sensitive resources. First, in terms of land use, a significant amount of redevelopment was assumed within the greater Madison Isthmus area, existing and planned mixed-use activity centers in Madison, and other suburban downtown areas. For the City of Madison, over one-half of new housing units were allocated to infill/redevelopment areas, while a sizable amount of employment was also allocated to these areas, including 10,000 jobs in the greater Isthmus area. The vast majority of all future growth was allocated to existing urban service areas. This growth allocation reflects the fact that the encouragement of development of high-density, mixed-use activity centers, primarily along existing and planned major transit corridors is a central recommendation of the City of Madison's Madison in Motion Transportation Plan and this RTP. The development of these centers is reflected in the land use growth forecast for the RTP.

In developing the future year 2050 travel forecast, implementation of the full bus rapid transit (BRT) system, addition of express bus service, and other planned service improvements were assumed despite the fact many of these services are not part of the financially constrained RTP. To address remaining traffic congestion, the impacts of new two-lane collector street connections and extensions were tested prior to consideration of any major capacity expansion projects on the arterial roadway system. Capacity expansion projects are thus considered only to address the residual traffic congestion not addressed by these land use and transportation measures, including greatly expanded public transit.

This planning approach is consistent with the policy of the Madison Area Transportation Planning Board – An MPO to utilize Transportation Demand Management (TDM), Transportation System Management (TSM), and Intelligent Transportation Systems (ITS) solutions prior to consideration of roadway capacity expansion. It is also the policy of the MPO to continue to accept higher congestion levels (generally Level of Service D, but also E in corridors with constraints that preclude added travel lanes) during peak hours on major roadways before giving consideration to expanding or building new roadway facilities.

The MPO has compiled a comprehensive GIS database of the location and quality of environmental and historic/cultural resources in the county. An environmental screening of proposed roadway capacity expansion projects has been conducted to identify those with potential impacts to any of these resources. This screening provides an early warning to policy makers and project sponsors of these potential impacts.

While inclusion of a recommended project in the regional transportation plan represents preliminary regional support for the

project, the projects go through several steps from conception to implementation and take many years to successfully complete. Detailed environmental analysis of individual projects occurs later in the project development process as the project approaches the preliminary engineering stage. At this stage, project design features may be refined and the environmental impacts and mitigation strategies can be identified.

During preliminary engineering and environmental studies of roadway capacity expansion projects with possible unavoidable impacts on environmentally sensitive resources, it is expected that efforts to eliminate or minimize any adverse impacts will be exhausted. Evaluation of alternatives should follow the fundamental NEPA hierarchy of avoid-minimize-mitigate. The scope of the necessary preliminary engineering and environmental studies would include the consideration of alternate alignments and cross-sections designed specifically to avoid, or if not possible, minimize the impacts on environmentally sensitive resources. To further minimize impacts, consideration should be given to the use of alternative design features or operational management measures. These might include special context sensitive design features, landscaping or screening to minimize impacts on parks or natural areas, or construction of a bridge over wetlands rather than a roadway on a filled embankment even if it significantly increases project costs. Another technique that should be considered to minimize impacts would be to seek exceptions or variances to design standards, which would reduce the roadway cross-section through the impacted area. Measures to reduce construction-related impacts should also be used.

Where environmentally sensitive resources will be unavoidably impacted, and for which mitigation is compensatory, efforts should focus on the preferred means of mitigation as identified by the federal and state regulatory agencies. Types of mitigation typically considered include: (1) Enhancement of the remaining adjacent environmentally sensitive resources, which will not be impacted as part of the roadway project; (2) Re-creation of the impacted environmentally sensitive resources; (3) Creation of new environmentally sensitive resources; or (4) Acquisition and utilization of mitigation bank credits. Potential mitigation sites could include areas within or adjacent to environmental corridors, isolated natural resource areas, and other mitigation bank sites. Mitigation banks are used when compensation at or near the project site is not practicable and the loss of the wetland is unavoidable. Currently, there is an active wetland mitigation bank site in the Town of Dane.

Established federal and/or state policy and guidelines exist with respect to compensatory mitigation of certain environmentally sensitive resources. With respect to wetlands, all wetland compensatory mitigation efforts must meet the Department of the Army (DA) requirements of Section 404 of the Clean Water Act including the United States Environmental Protection Agency 404(b)(1) Guidelines at 40 Code of Federal Regulations (CFR) Part 230, and the April 2008 Federal Rule - Compensatory Mitigation for Losses of Aquatic Resources found at 33 CFR Part 332 (Federal Mitigation Rule), Section 10 of the Rivers and Harbors Act, and WisDNR requirements in Section 281.36 of the Wisconsin Statutes, Chapter NR 350 of the Wisconsin Administrative Code, 2011 State of Wisconsin Act 118, as well as other applicable federal and state statutes, regulations, guidelines, and ordinances.

For Wisconsin Department of Transportation (WisDOT) projects, compensatory mitigation efforts must meet the requirements of the WisDOT Wetland Mitigation Banking Technical Guidelines, which set out the operational criteria for wetland mitigation banks and the responsibilities of the Federal and state resource and transportation agencies. These agencies include the Wisconsin Department of Natural Resources (WisDNR), U.S. Army Corps of Engineers, U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service, and Federal Highway Administration. The Guidelines were first developed in 1993 following the establishment of a state policy on wetland banking for WisDOT through an amendment to the cooperative agreement between WisDOT and WisDNR. The Guidelines have been revised twice, most recently in 2002. An interagency review team oversees the operation and maintenance of wetland banks.

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APPENDIX D: MAP BOOK

While drafting the Regional Transportation Plan 2050, MATPB staff created a number of detailed maps that were not included in the main plan report. These maps were not included within the main body for the plan for a variety of reasons – lack of direct relevance to plan text, duplicity, or because they were part of an iterative process to reach a desired final product. Maps that were not included within the main RTP are included within the Map Book. Further, high-quality, full-page version of maps found in the main plan report can be found in the Map Book.

All maps in the Map Book are current as of April 2017. Newer maps may be available at the MPO's website, MadisonAreaMPO.org/Maps, or by contacting MATPB staff.

The following maps are included in the map book:

Land Use, Employment, and the Environment

- MPO Boundaries
- Land Use 2010
- Land Use Change 1990 - 2010
- Population Density 2010
- Employment Density 2010
- Housing + Transportation Costs

Roadways

- Roadway Functional Classification System in Dane County
- Future Planned Roadway Functional Classification System in Dane County
- 1992/2013 Average Weekday Traffic Volume Change in the Madison Area
- 2012/2013 Average Weekday Traffic Volume in the Madison Area
- Average Midweek AM Travel Speeds
- Average Midweek PM Travel Speeds
- Traffic Congestion during Typical Weekday PM Peak Period, October 2015
- Traffic Congestion during the Worst Weekday PM Peak Period, October 2015
- Bottlenecks in Greater Dane County – October, 2015
- Pavement Condition of Dane County Roadways - 2015
- Fatal and Serious Injury Crash Rate Summary for State Highways 2010 – 2014
- High Frequency Fatal or Serious Injury Crash Locations 2010 – 2014

Bikes

- Existing Bicycle Facilities
- Planned Bicycle Facilities
- Planned Primary Regional Route System
- Bicycle Crashes
- Planned Priority Regional Shared-Use Paths
- Regional Bikeway Gaps and Barriers
- Planned Future Bicycle Network Functional Class within the Madison Metropolitan Area

Pedestrian

- Existing Pedestrian Facilities
- Sidewalk Deficiency Analysis Ages 17 and Under
- Sidewalk Deficiency Analysis Ages 67 and Over
- Regional Pedestrian Network Improvement Needs

Transit

- Transit Service Area, 2016
- Transit Ridership, 2016
- Future Planned Regional Transit Service Network
- Future Regional Transit Corridors
- Madison Area Park and Ride Lot System
- Intercity Bus Stops in the Madison Area
- 15-minute Transit Accessible Areas – Grocery Store, Mid-day
- 15-minute Transit Accessible Areas – Grocery Store, Saturday
- 45-minute Transit Accessible Area – Employment Centers, Mid-day

Transit (continued)

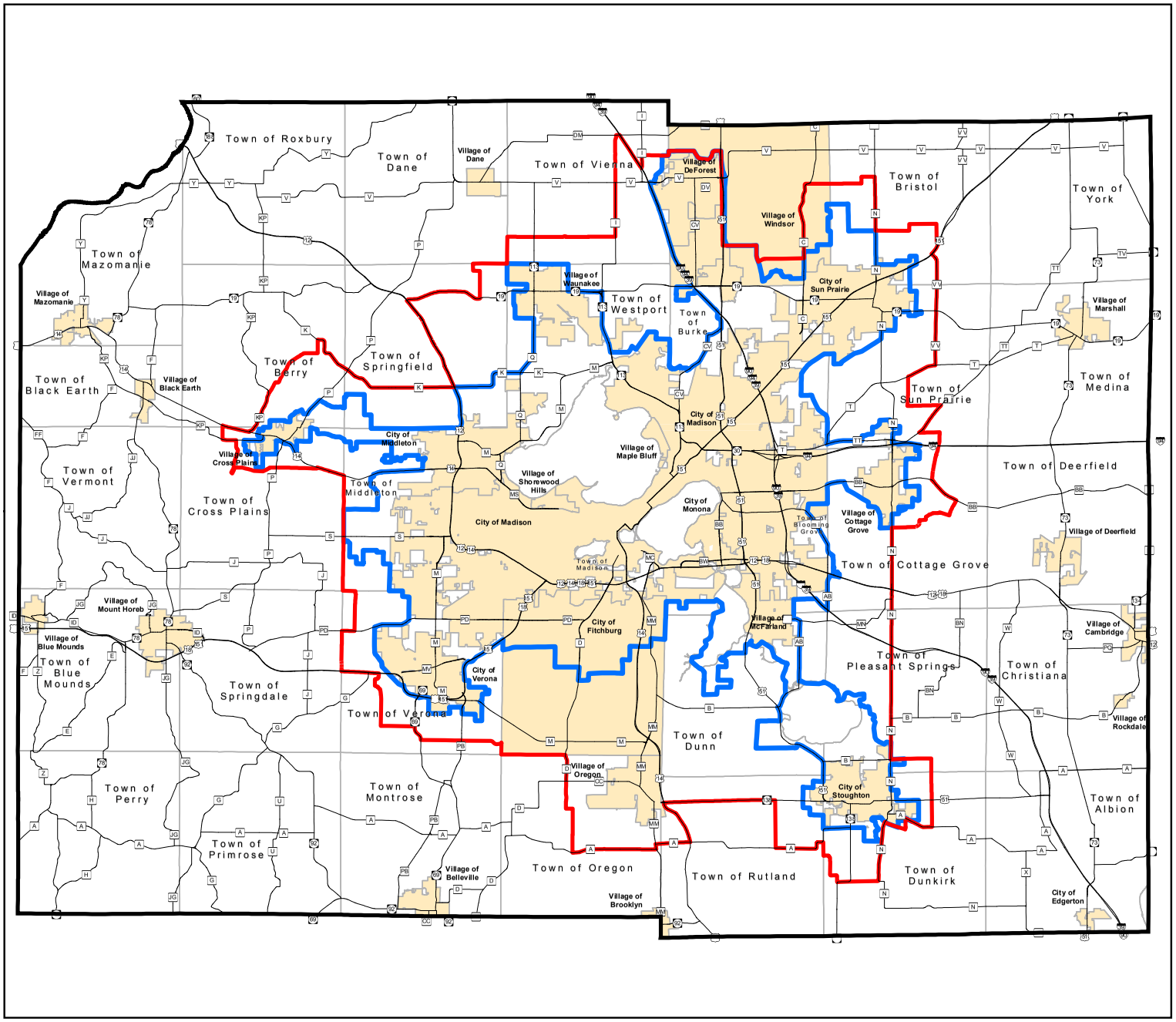
- 45-minute Transit Accessible Area – Employment Centers, PM peak
- 30-minute Transit Accessible Areas – Environmental Justice (EJ) Areas, AM Peak
- 30-minute Transit Accessible Areas – Environmental Justice (EJ) Areas, Mid-day
- Jobs within 30 minutes of Transit on Existing Transit Network
- Jobs within 30 minutes of Transit on Future Transit Network
- Jobs within 45 minutes of Transit on Existing Transit Network
- Jobs within 45 minutes of Transit on Future Transit Network
- Increase of Jobs within 45 minutes of Transit on Future Transit Network

Miscellaneous

- Rail Network - Dane County
- Freight Routes, Facilities, and Service
- Freight Traffic Congestion, 2007
- Annual Truck Freight Tonnages, 2007
- Approved STBG (Formerly STP) Urban Projects and Candidate New Projects for Funding 2017-2021
- 2017-2021 Transportation improvement Program – Major Pedestrian/Bicycle Projects
- 2017-2021 Transportation improvement Program – Major Roadway Projects in the Madison Metropolitan Planning Area
- 2017-2021 Transportation improvement Program – Major Roadway Projects in Outer Dane County Area

Regional Transportation Plan 2050 Madison Area
Charting Our Course

Planning Boundaries of the Madison Area Transportation Planning Board



- Metropolitan Planning Area Boundary
  (approved by WisDOT 7/30/13)
- Madison Urban Area
  (approved by U.S. DOT 6/11/13, revision approved by MATPB 3/4/15)
- Incorporated Area (2016)

Prepared by staff to the:
Madison Area Transportation Planning Board
A Metropolitan Planning Organization (MPO)

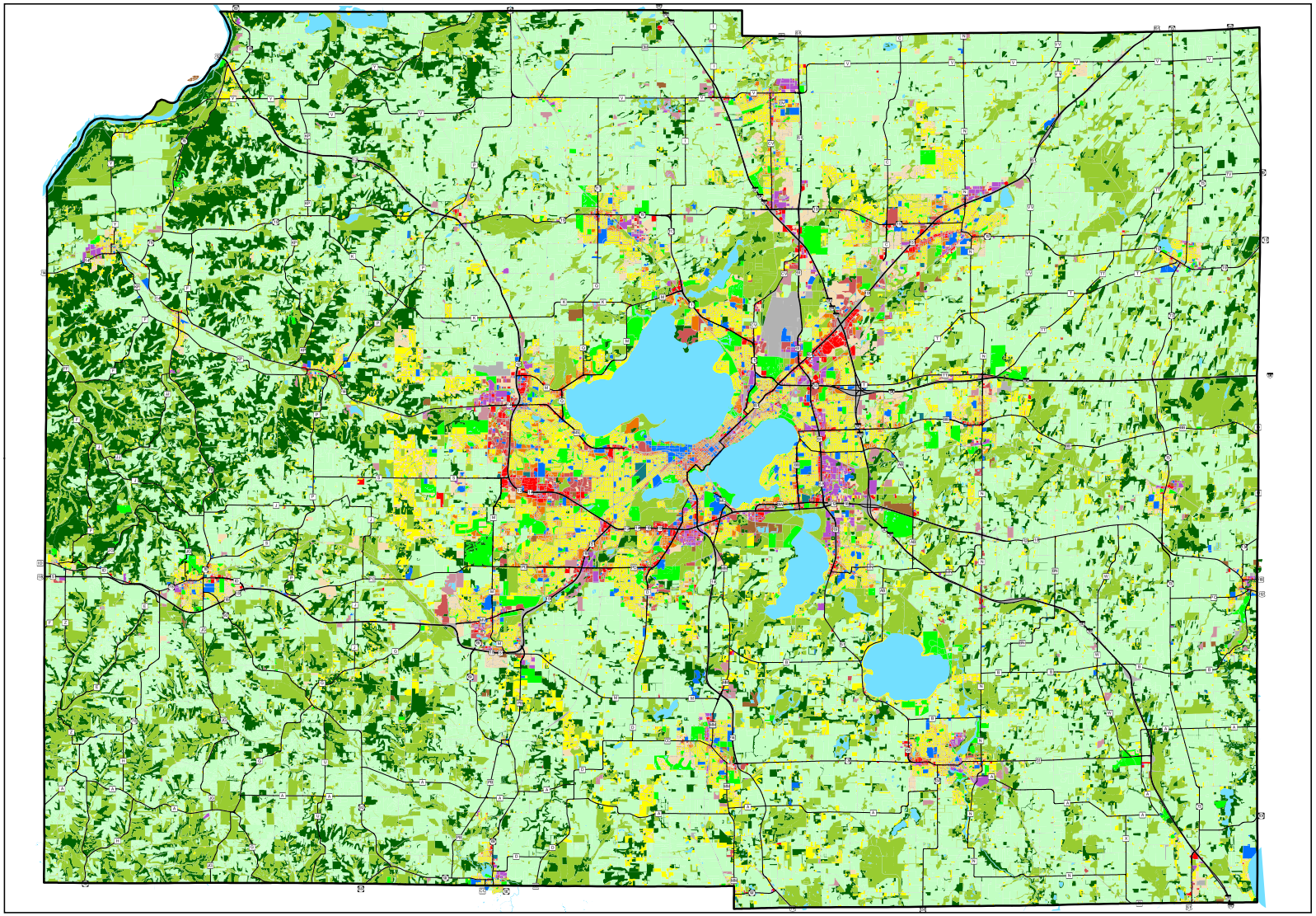
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Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

Regional Transportation Plan 2050 Madison Area
Charting Our Course

Dane County Land Use 2010



- Single Family Residential
- Two Family Residential
- Multiple Family Residential
- Commercial - Retail Services
- Commercial - Retail Sales
- Industrial
- Extractive
- Institutional/Governmental
- Transportation
- Communication and Utilities
- Recreation
- Cemeteries
- Woodlands
- Agriculture
- Undeveloped (non-agriculture)
- Vacant
- Under Construction
- Open Water

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Madison Area T·P·B Transportation Planning Board

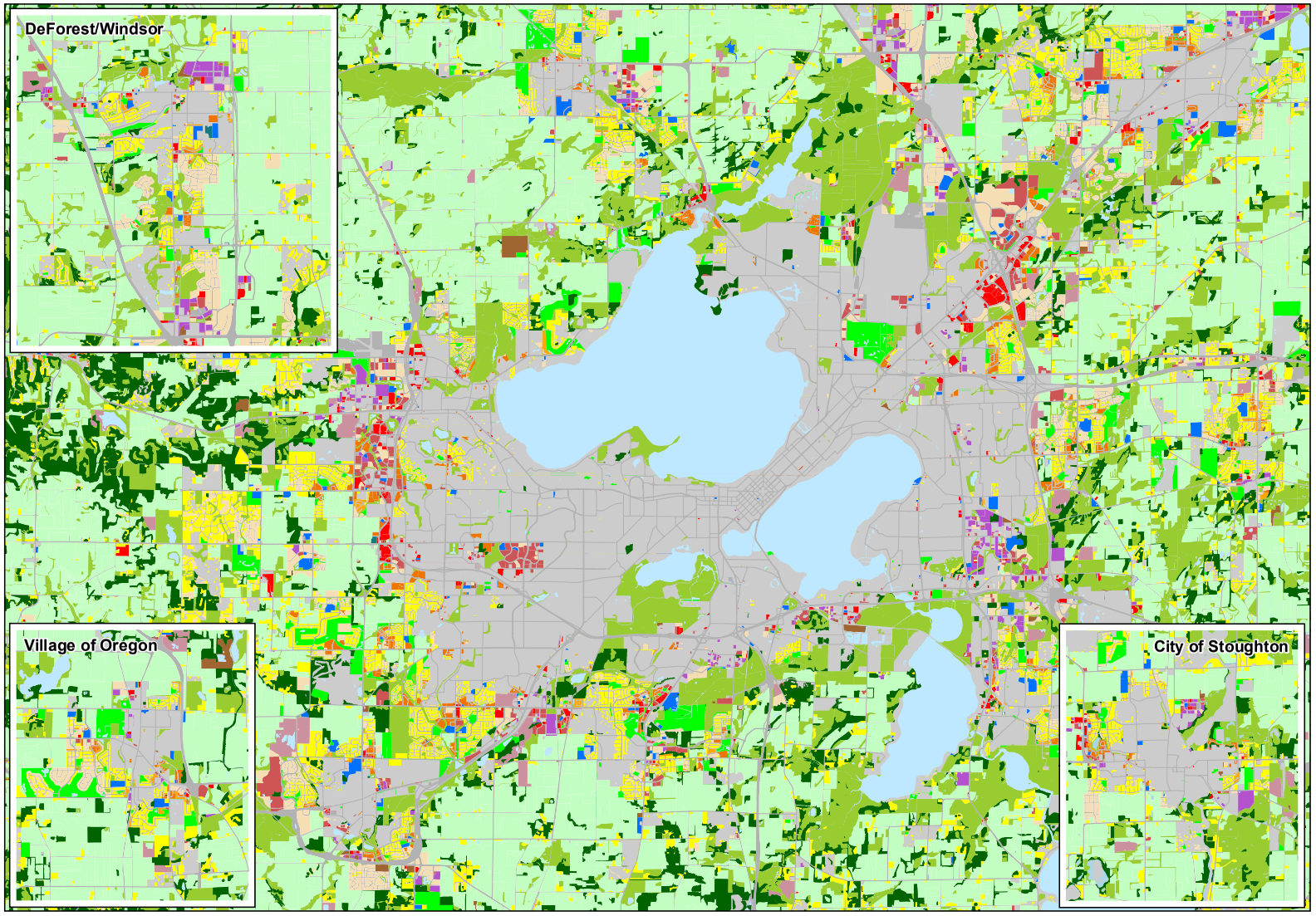
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Date Revised: 11/29/2016

Lambert Conformal Conic Projection
WISCRS: Dane, NAD 83(91)

Regional Transportation Plan 2050
Charting Our Course
Madison Area

1990 - 2010 Land Use Change Madison Metro Area



Development (1990 - 2010)

- Vacant
- Agriculture
- Woodlands
- Undeveloped (non-agriculture)
- Open Water
- Single Family Residential
- Two Family Residential
- Multiple Family Residential
- Commercial - Retail Services
- Commercial - Retail Sales
- Industrial
- Extractive
- Institutional/Governmental
- Transportation
- Communication and Utilities
- Recreation
- Cemeteries
- Under Construction
- Existing Development (1990)

Note:
The 1990 and 2010 land use data models are slightly different. Large rural residential parcels were not digitized at the parcel level for 1990. Only rooftop locations of residential buildings were collected. In 2010 the entire area of residential use digitized.

When overlaying the 1990 existing development (in gray) on the 2010 land use, as this map does, some 2010 rural residential parcels will not be masked by the 1990 development.

Therefore, in some rural areas, there may appear to be more of an in increase in residential development than what actually occurred

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Madison Area
T•P•B
Transportation Planning Board
A Metropolitan Planning Organization (MPO)

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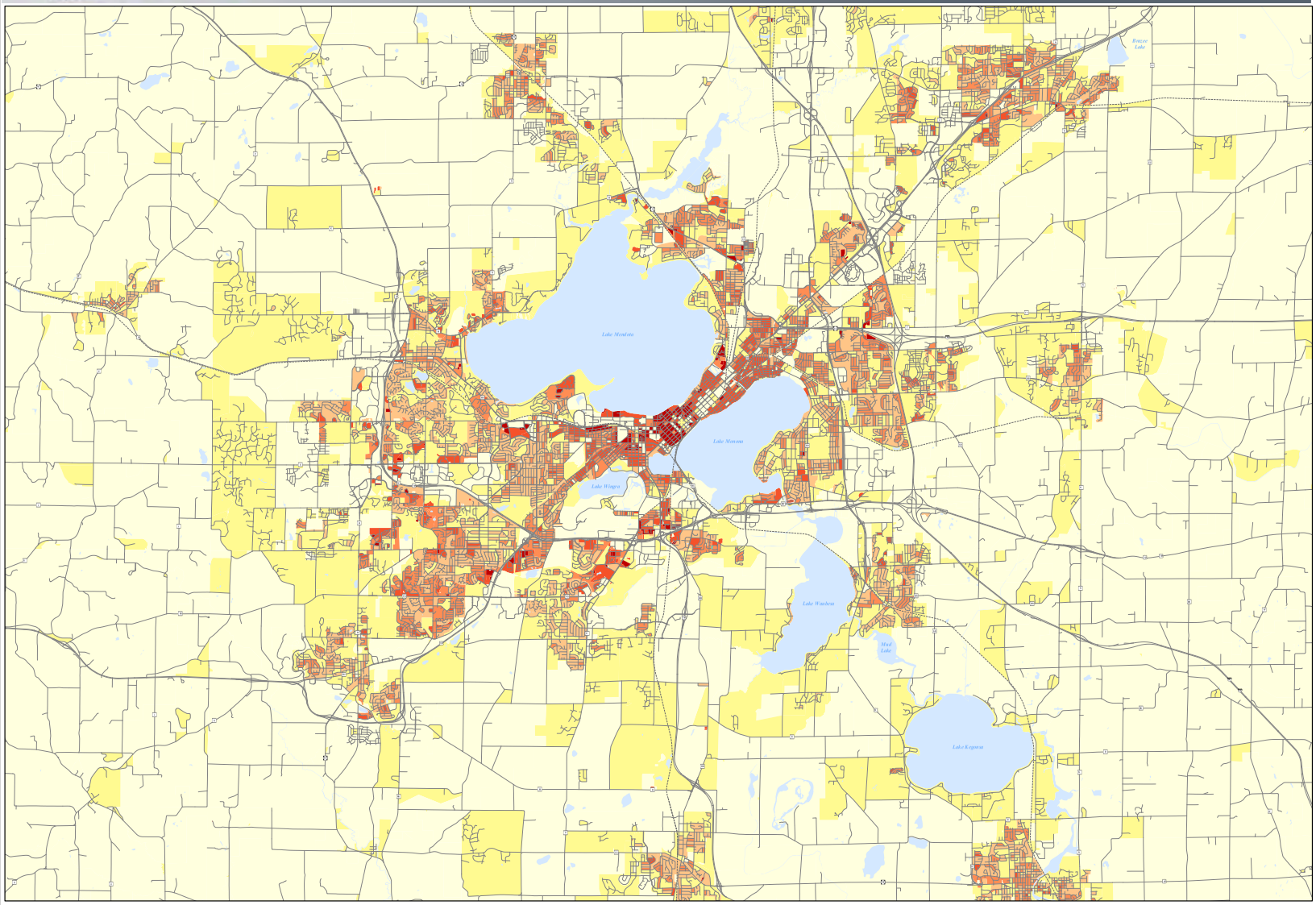
Date Revised: 12/6/2016

Lambert Conformal Conic Projection
WISCRS--Dane, NAD 83(91)

Regional Transportation Plan 2050
Charting Our Course
Madison Area

2010 Population Density by Census Block

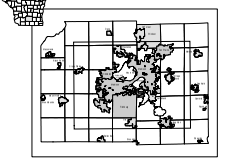
Madison Metropolitan Area
Dane County, Wisconsin



Persons Per Acre

- 0.0 - 0.2
- 0.3 - 5.0
- 5.1 - 8.0
- 8.1 - 13.0
- 13.1 - 32.0
- 32.1 - 368.2

Dane County, Wisconsin

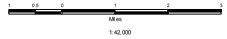


Prepared by staff to the:

T•P•B

Rev: 6/6/2011





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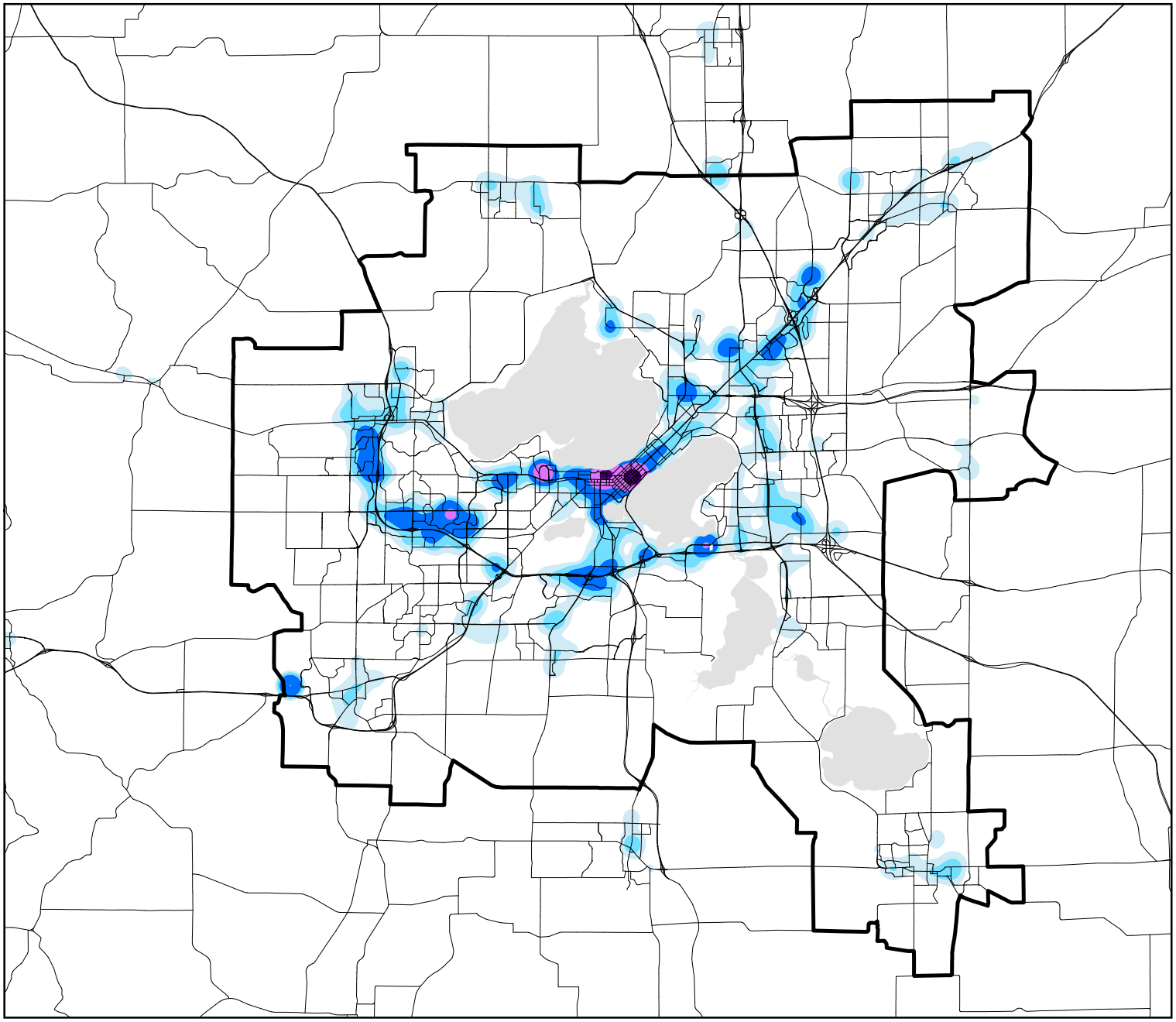
Lambert Conformal Conic Projection
WISCRS - Dane - - NAD 83(91)

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Regional Transportation Plan 2050 Madison Area
Charting Our Course

2010 Employment Density Madison Metropolitan Area



Jobs per Acre

- 0 to 2.0
- 2.1 to 5.0
- 5.1 to 10.0
- 10.1 to 25
- 25.1 to 75.0
- 75.1 or Greater

- Metropolitan Planning Area Boundary
- Arterial or Collector Roadway

Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

Source Info:
Bicycle Paths and Routes: 2014 (MATPB).
Employment: 2010, Orthophoto Derived (SCLIO).
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Civil Division Limits: 2014, Annexation Records (DCLIO).

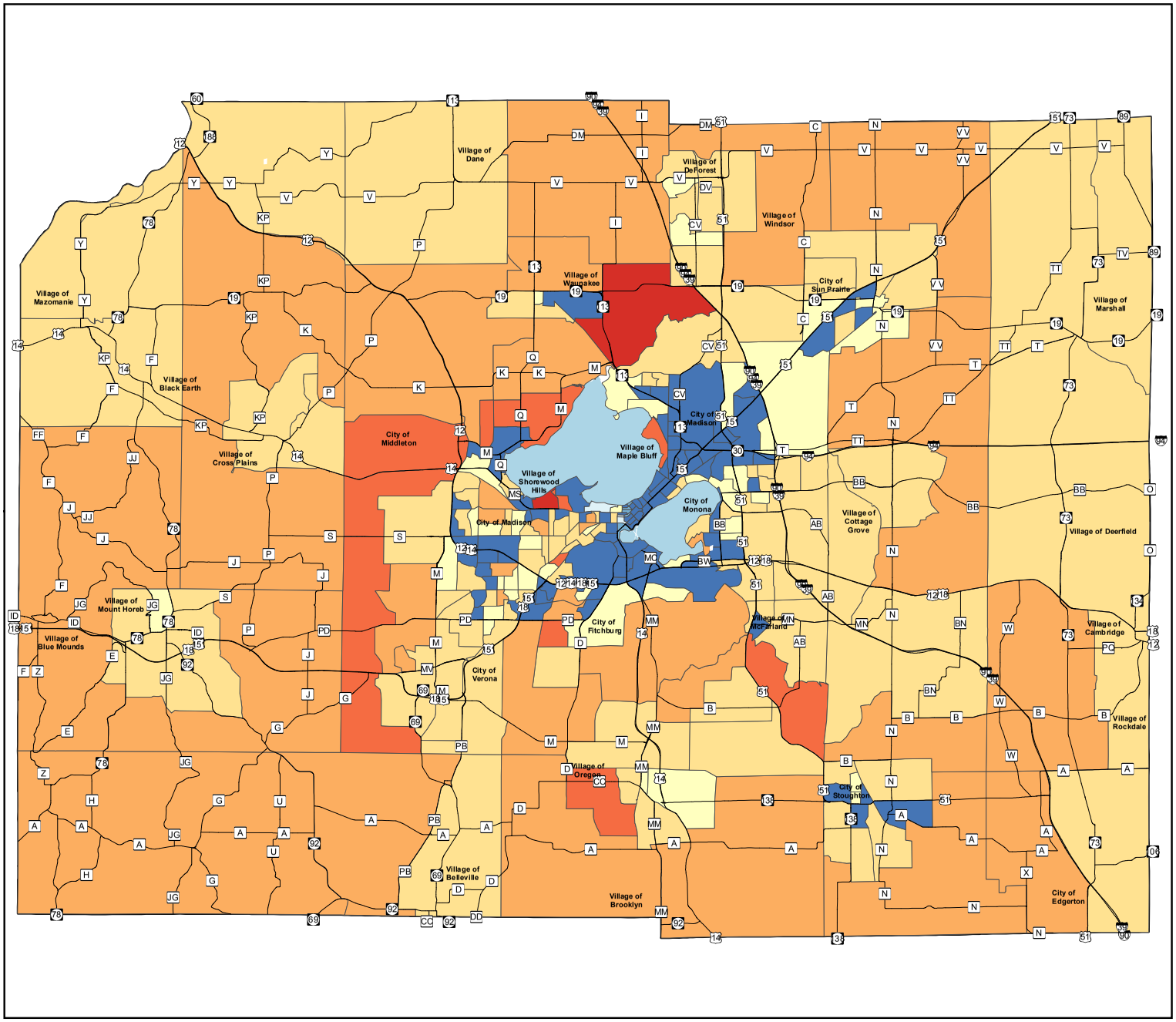
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Date Revised: 12/22/2015

Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Combined Housing and Transportation Costs as a % Income for the Region Typical Household



Affordable

- 0% - 10%
- 11% - 20%
- 21% - 30%
- 31% - 45%
- 46% - 85%

Unaffordable

- 46% - 50%
- 51% - 60%
- 61% - 70%
- 71% - 80%
- 81% - 85%

The typical Dane County household assumes a household earning the median income, with the average household size, and the average number of commuters per household for the county.

Housing + Transportation Costs 45% or less of household income are considered affordable.

Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

Source Info:
Center for Neighborhood Technology, NATPB

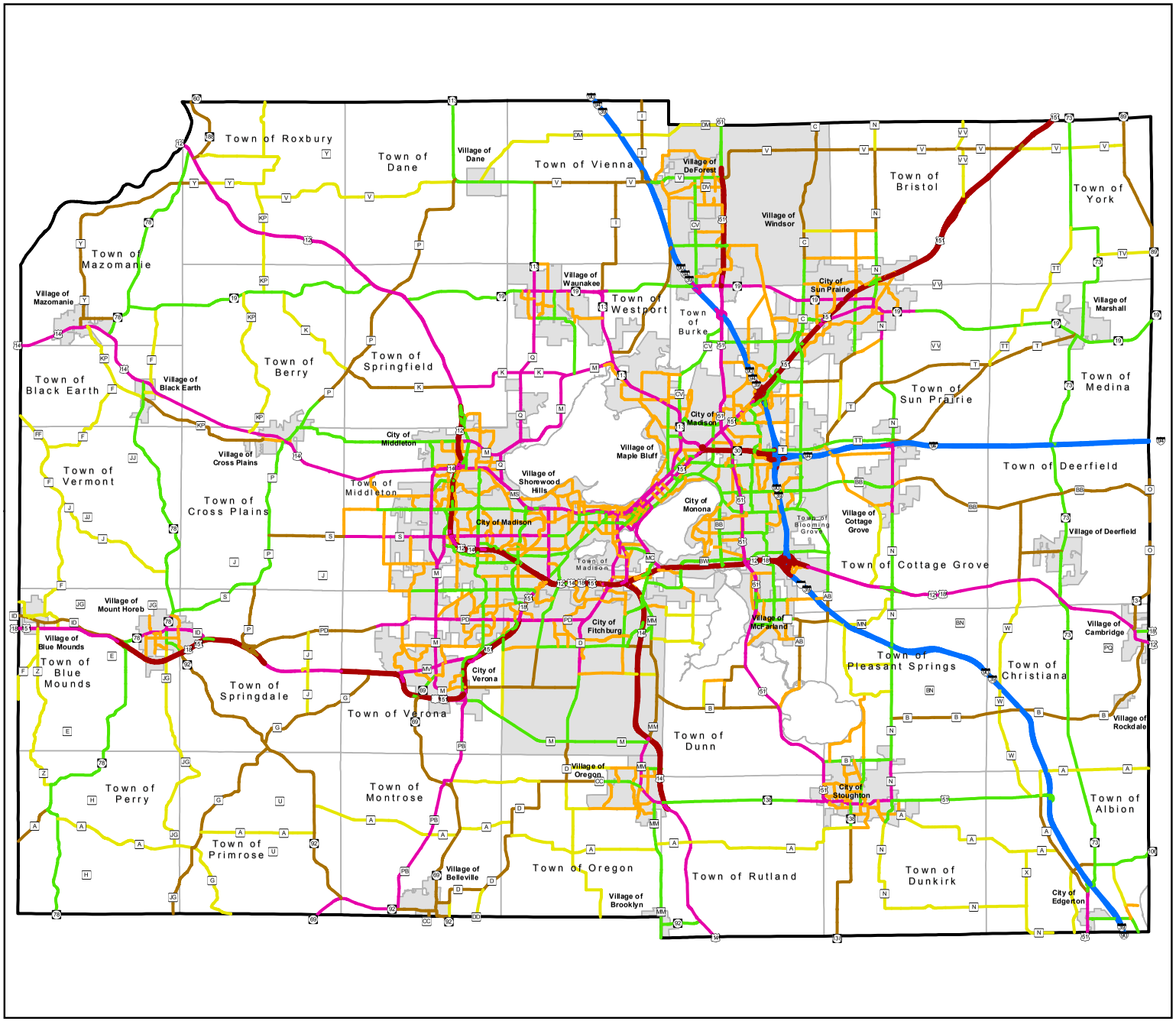
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Date Revised: 12/6/2016

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Curent Functional Classification System



- Principal Arterials - Interstate
- Principal Arterials - Other Freeway
- Principal Arterials - Others
- Minor Arterials
- Collectors - Urban
- Collectors - Major, Rural
- Collectors - Minor, Rural

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Madison Area T•P•B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

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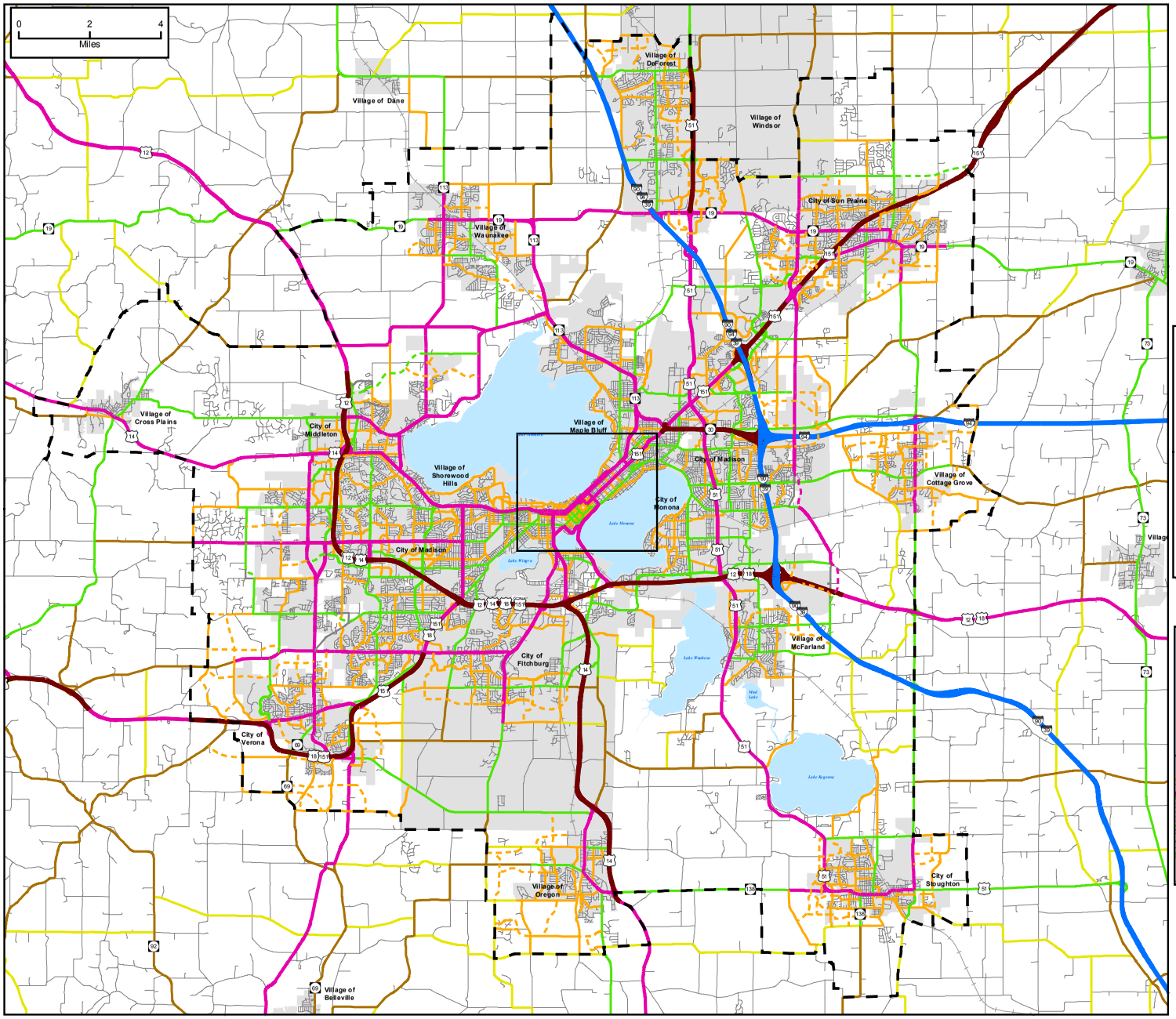
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Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

Regional Transportation Plan 2050
Madison Area
Charting Our Course

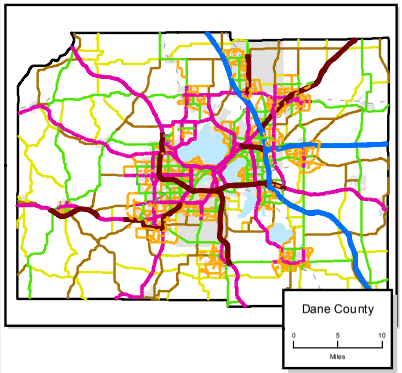
Future Planned Roadway Functional Classification System (2050)

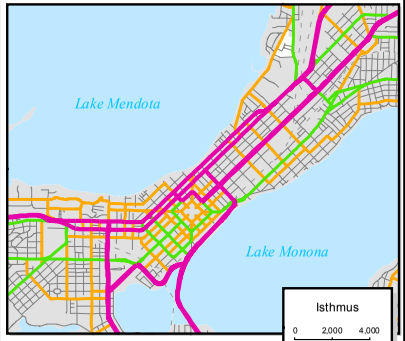


Functional Classifications*

- Principal Arterials - Interstate
- Principal Arterials - Other Freeways
- Principal Arterials - Other
- Minor Arterials
- Collectors - Urban
- Collectors - Major, Rural
- Collectors - Minor, Rural
- Local
- MPO Boundary

*Dashed lines indicate future streets and alignments.





Prepared by staff to the:
Madison Area T.P.B. Transportation Planning Board

Source Info:
Street Base: 2016 (MATPB, DCLIO).
Functional Classifications: 2010 (MATPB).
Hydrography: 1:2000, 1:24,000 (WDNR)

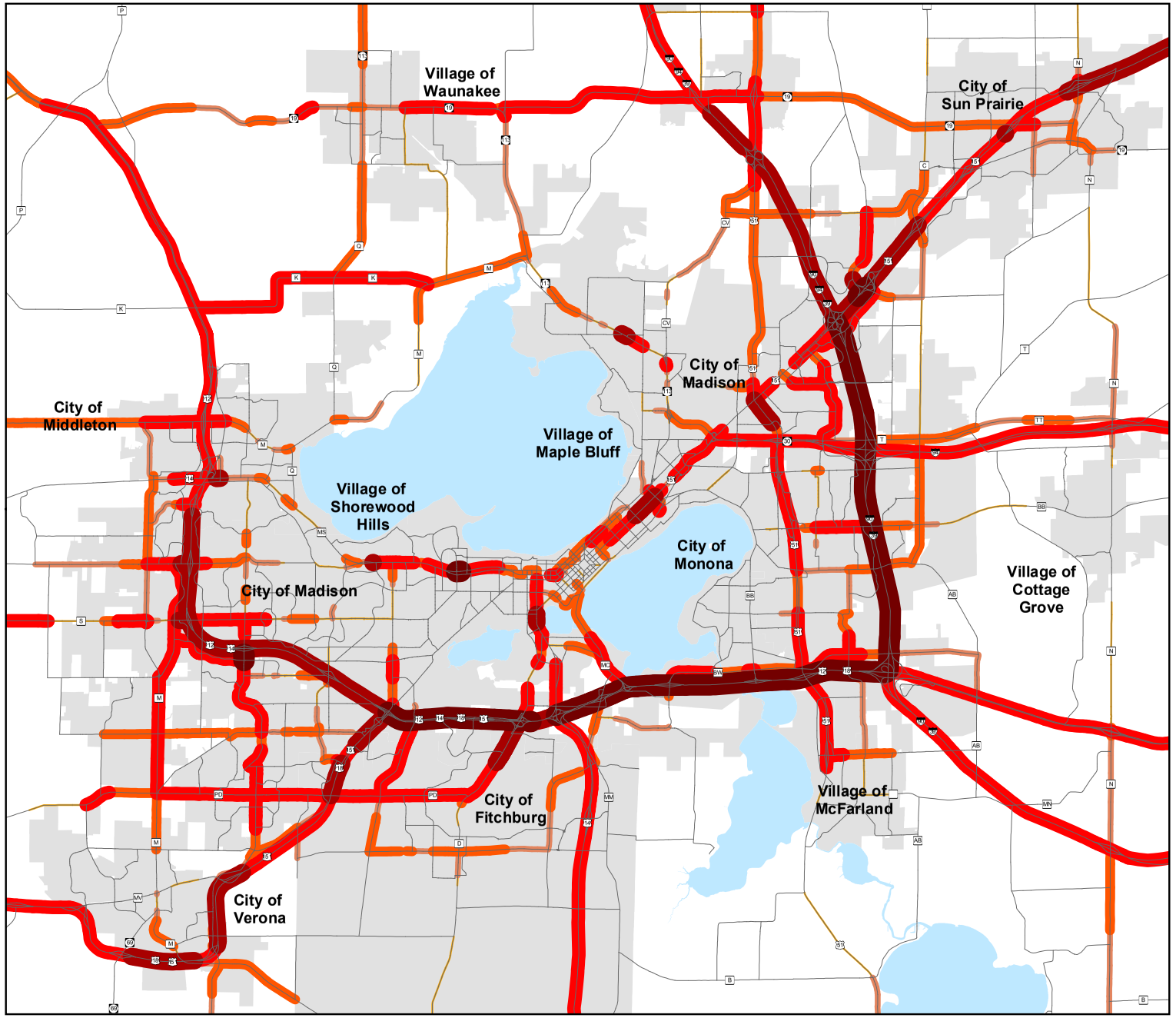
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Date Revised: 2/24/2017

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050
Madison Area
Charting Our Course

1992/2013 Average Weekday Traffic Volume Change Madison Area Arterial Roadway System



0 - 1,000
1,001 - 2,500
2,501 - 5,000
5,001 - 15,000
15,001 - 30,000
30,000+

Prepared by staff to the:
Madison Area Transportation Planning Board
A Metropolitan Planning Organization (MPO)

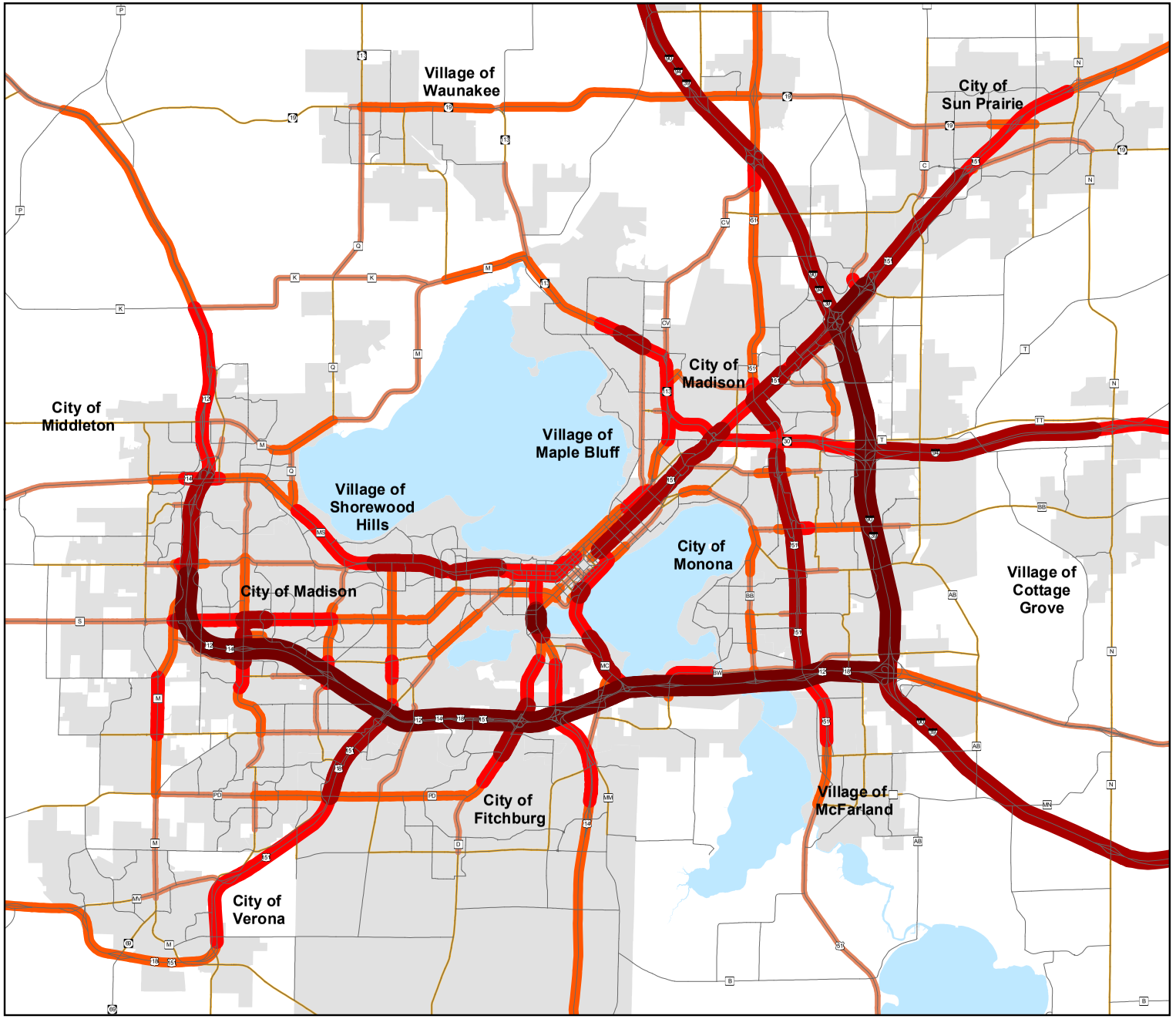
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Miles
Date Revised: 11/29/2016

Source Info:
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Author: jlw
Date Printed: 11/29/2016
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Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

Regional Transportation Plan 2050 Madison Area
Charting Our Course

2012/2013 Average Weekday Traffic Volume Madison Area Arterial Roadway System



- Less than 10,000
- 10,001 - 17,000
- 17,001 - 25,000
- 25,001 - 40,000
- 40,001 - 64,000
- 64,001 144,000

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Madison Area T•P•B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

0 0.75 1.5
Miles
Date Revised: 11/29/2016

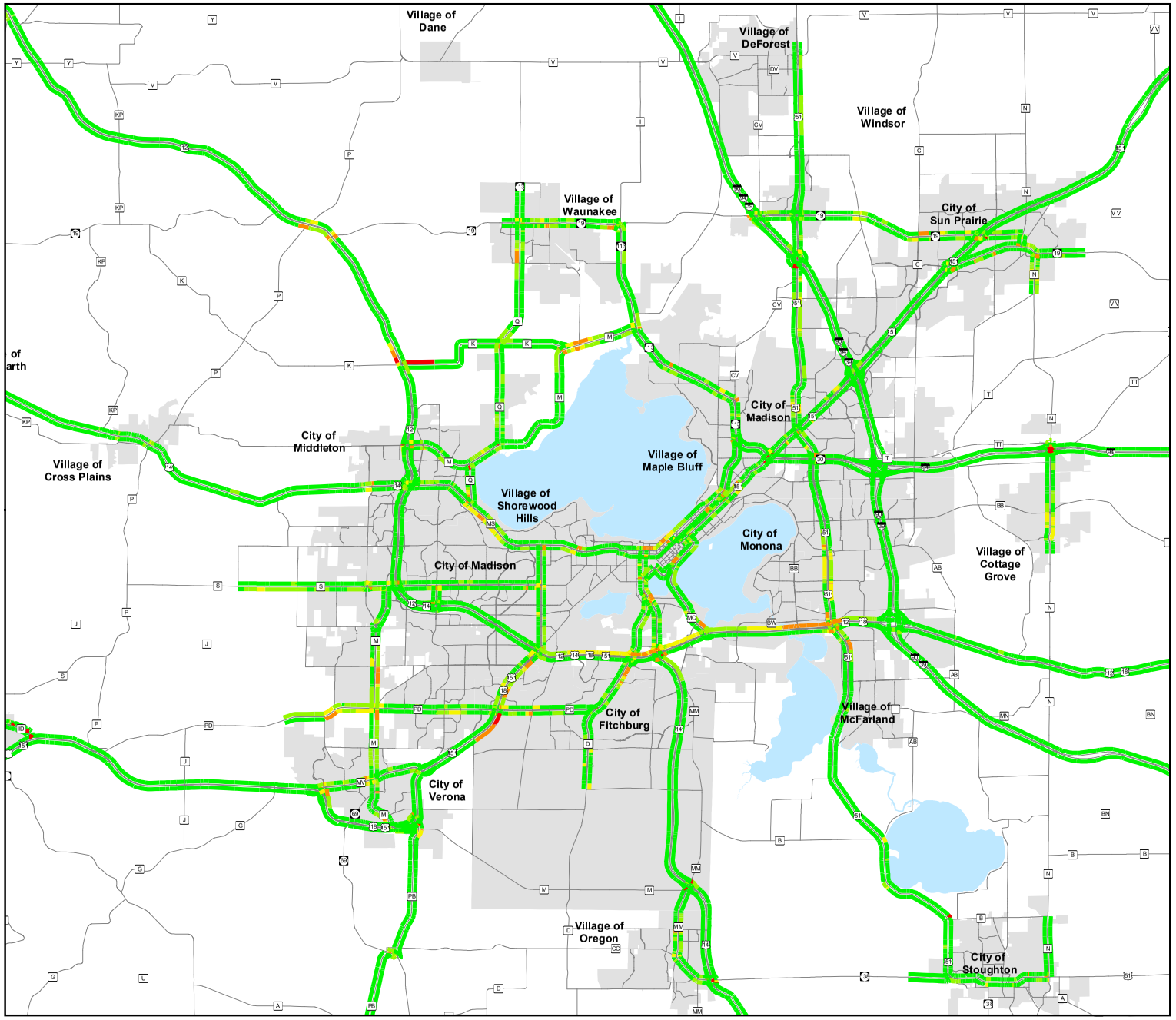
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City of Madison Traffic Engineering, WisDOT, MATPB

Author: jclay
Date Printed: 11/29/2016
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Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Ratio 7-8 am Travel Speeds to Off-Peak Average Speeds for Tuesday, Wednesday, Thursday, 60 Minute Interval



- 0.00 to 0.50
- 0.51 to 0.75
- 0.76 to 0.85
- 0.86 to 0.95
- 0.96+

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0 1.25 2.5
Miles
Date Revised: 11/29/2016

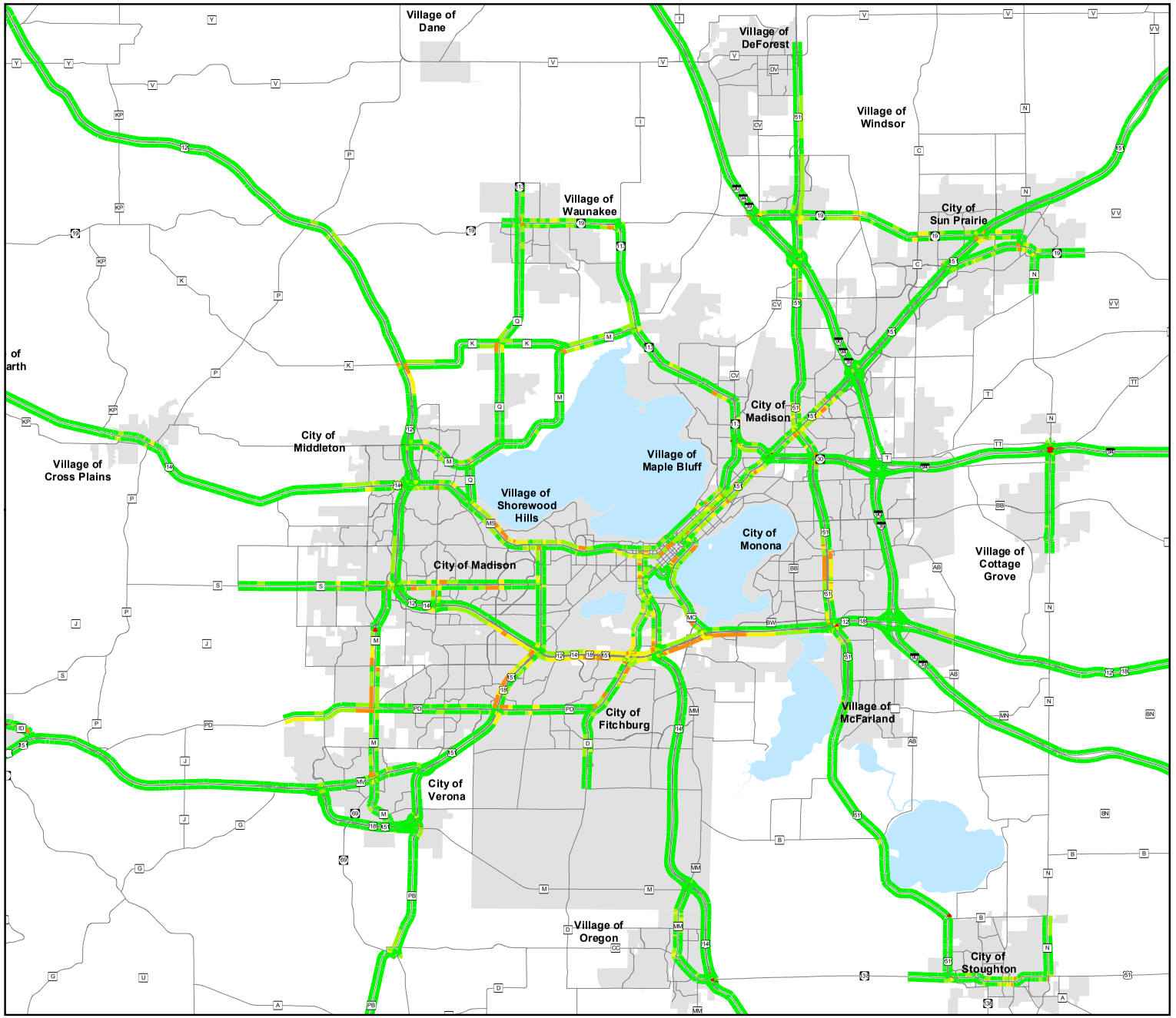
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Author: jzg
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Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Ratio 4-5 pm Travel Speeds to Off-Peak Average Speeds for Tuesday, Wednesday, Thursday, 60 Minute Interval



- 0.00 to 0.50
- 0.51 to 0.75
- 0.76 to 0.85
- 0.86 to 0.95
- 0.96 +

Prepared by staff to the:
Madison Area Transportation Planning Board
A Metropolitan Planning Organization (MPO)

0 1.25 2.5
Miles
Date Revised: 11/29/2016

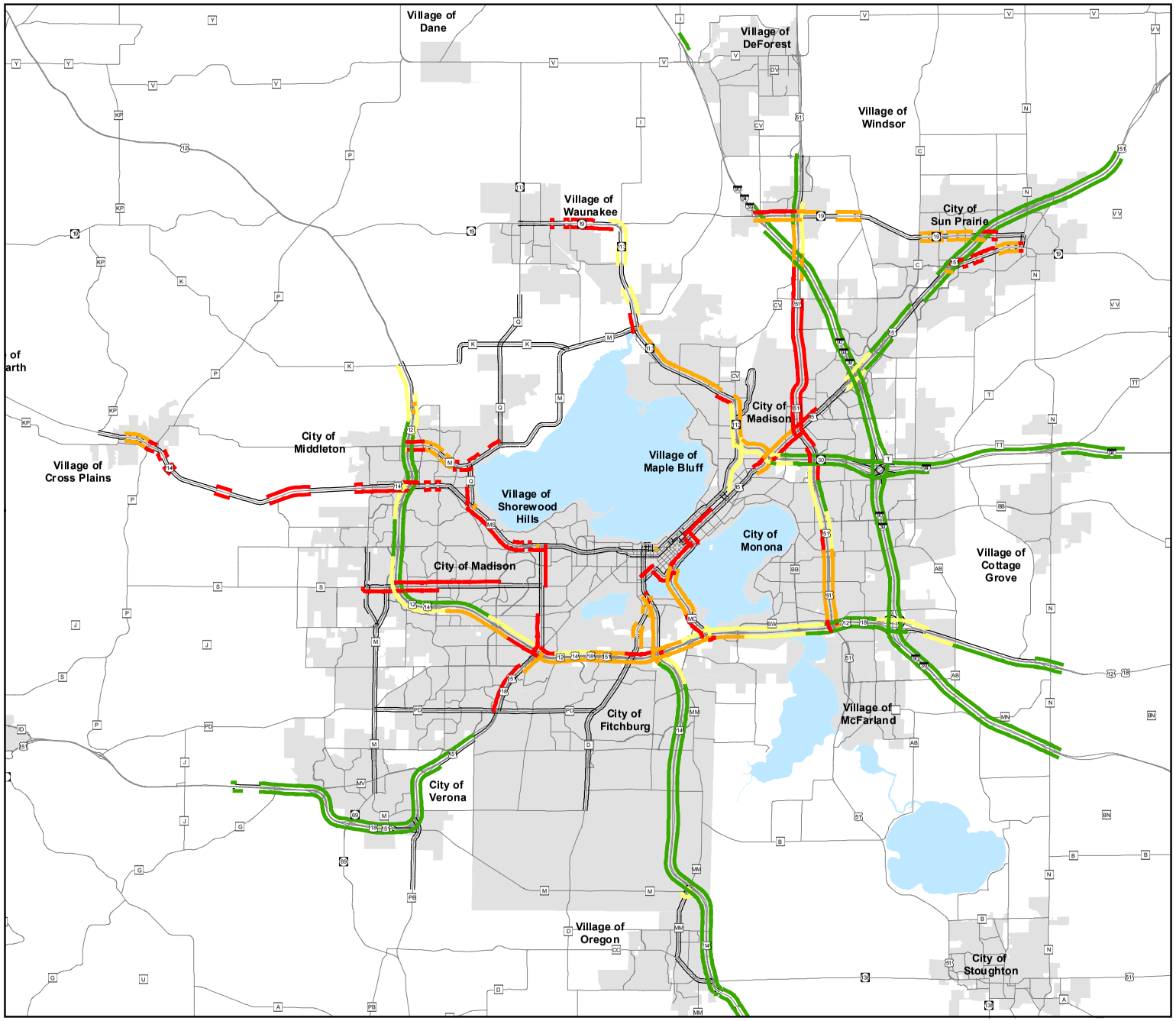
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WISCRS - Dane, NAD 83(91)

Source Info:
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Regional Transportation Plan 2050
Madison Area
Charting Our Course

Traffic Congestion on Typical Weekdays 4 PM - 7 PM, 2015



- 1.0 - 1.25
- 1.26 - 1.75
- 1.76 - 2.50
- 2.51 or more
- No Data Available

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A Metropolitan Planning Organization (MPO)

0 1.25 2.5
Miles
Date Revised: 4/18/2017

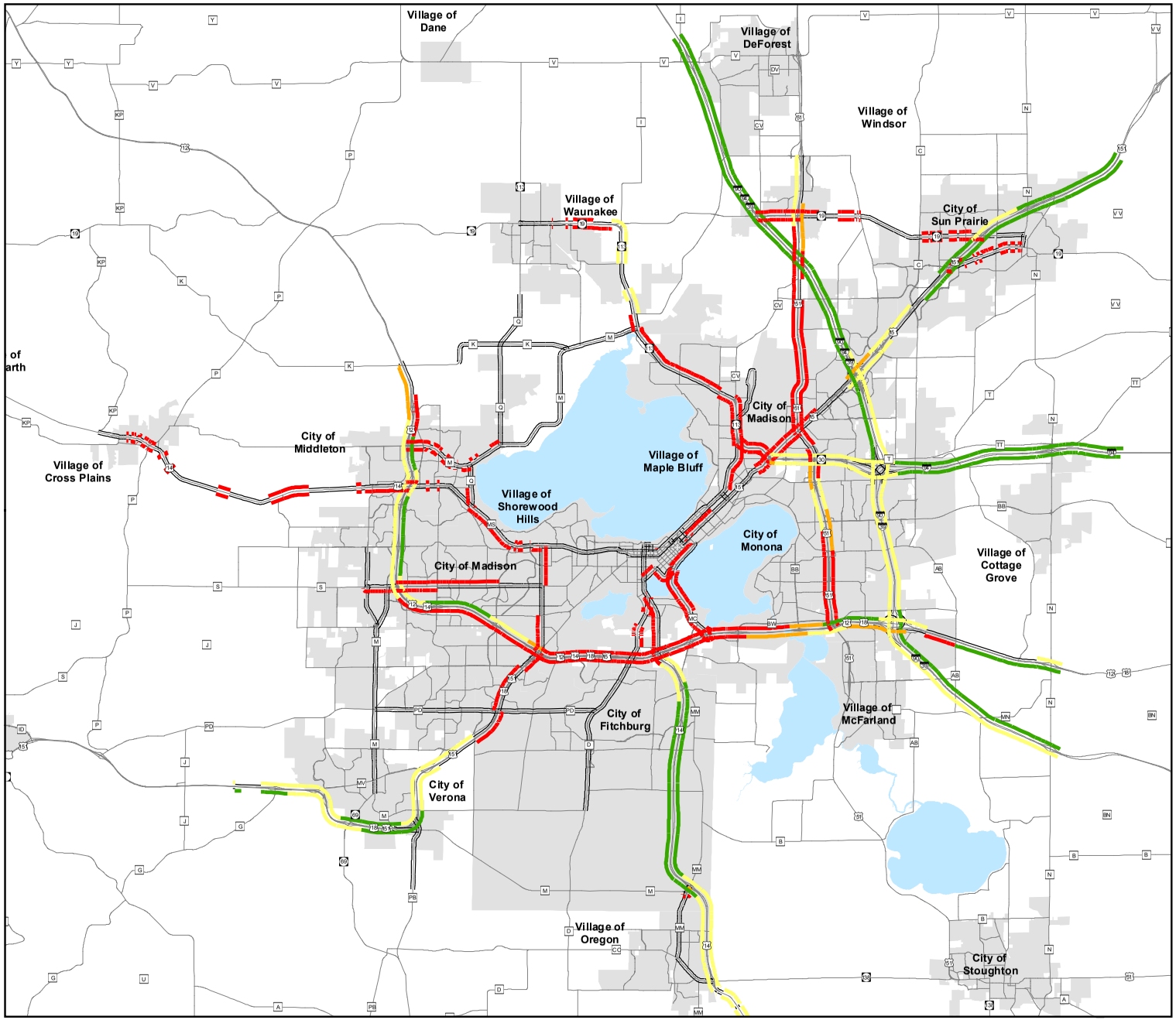
Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Source Info:
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Author: dmk
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Regional Transportation Plan 2050
Madison Area
Charting Our Course

Traffic Congestion during the Most Congested Weekday 4 PM - 7 PM, 2015



- 1.0 - 1.25
- 1.26 - 1.75
- 1.76 - 2.50
- 2.51 or more
- No Data Available

Prepared by staff to the:
Madison Area Transportation Planning Board

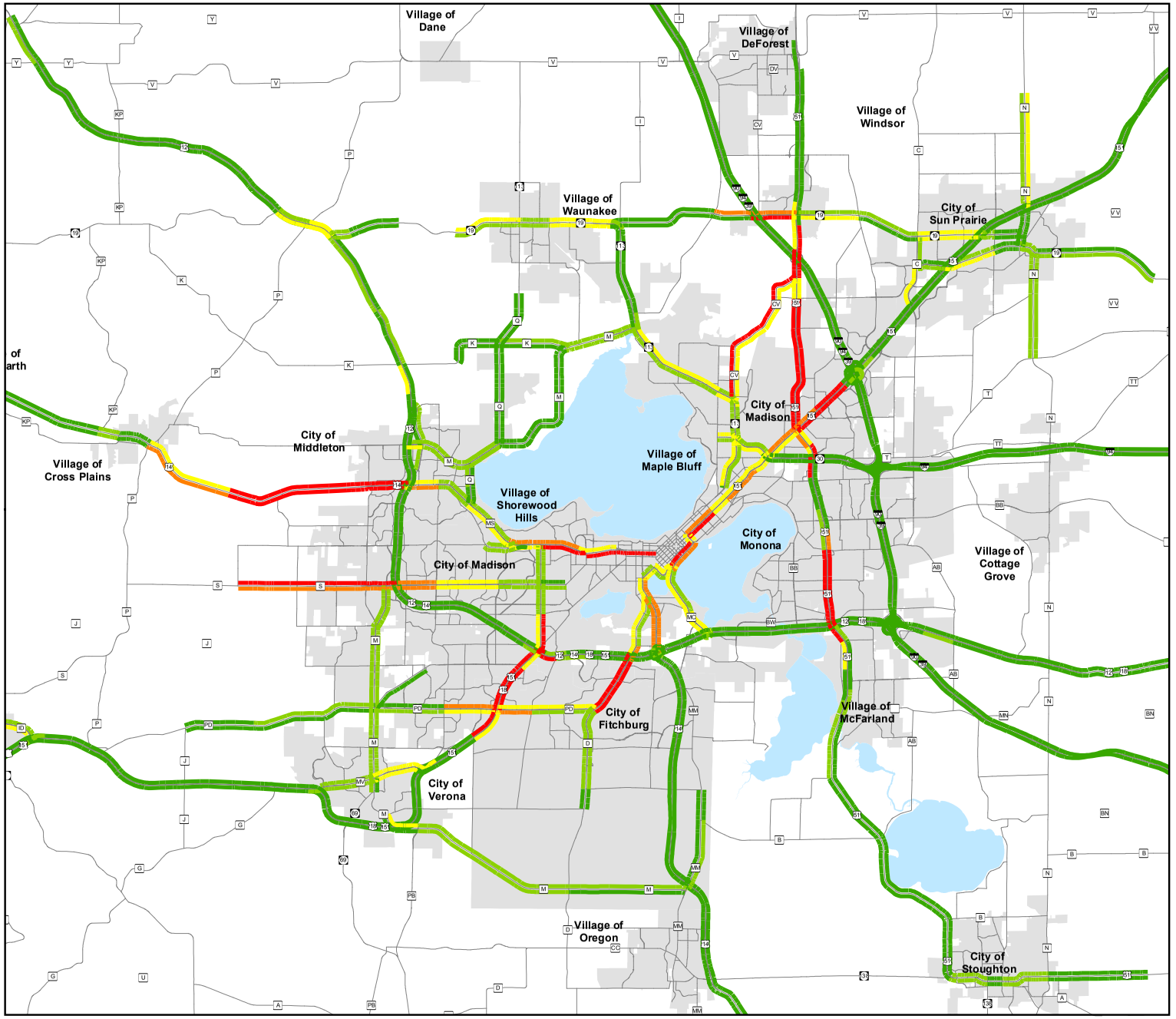
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Miles
Date Revised: 4/19/2017

Source Info:
DCLIO, WisDOT, TomTom, MATPB

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050 Madison Area
Charting Our Course

Bottlenecks in Greater Dane County October, 2015



of Bottlenecks

- < 150
- 151 - 300
- 301 - 450
- 451 - 600
- > 600

Bottlenecks are a count of occurrences when speed is below 60% of freeflow.

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Madison Area T•P•B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

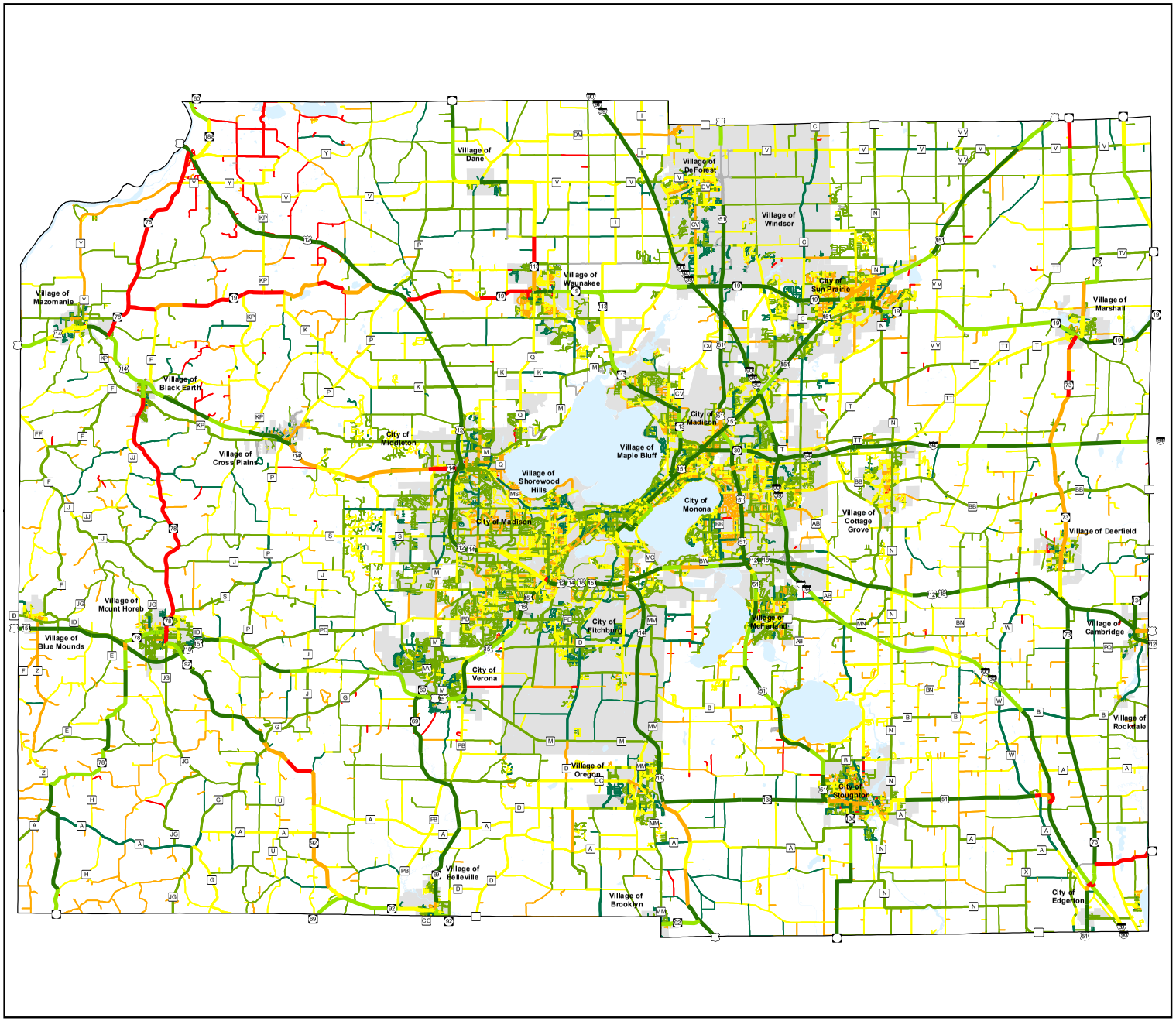
0 1.25 2.5 Miles

Date Revised: 11/29/2016

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Pavement Condition of Dane County Roadways 2015



- Very Good to Excellent
- Good
- Fair
- Poor
- Very Poor

* Arterial and Collectors are depicted with a thicker line.

Based upon 2015 WisDOT PASER and WISLR pavement ratings

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Madison Area T•P•B Transportation Planning Board
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0 2 4 Miles

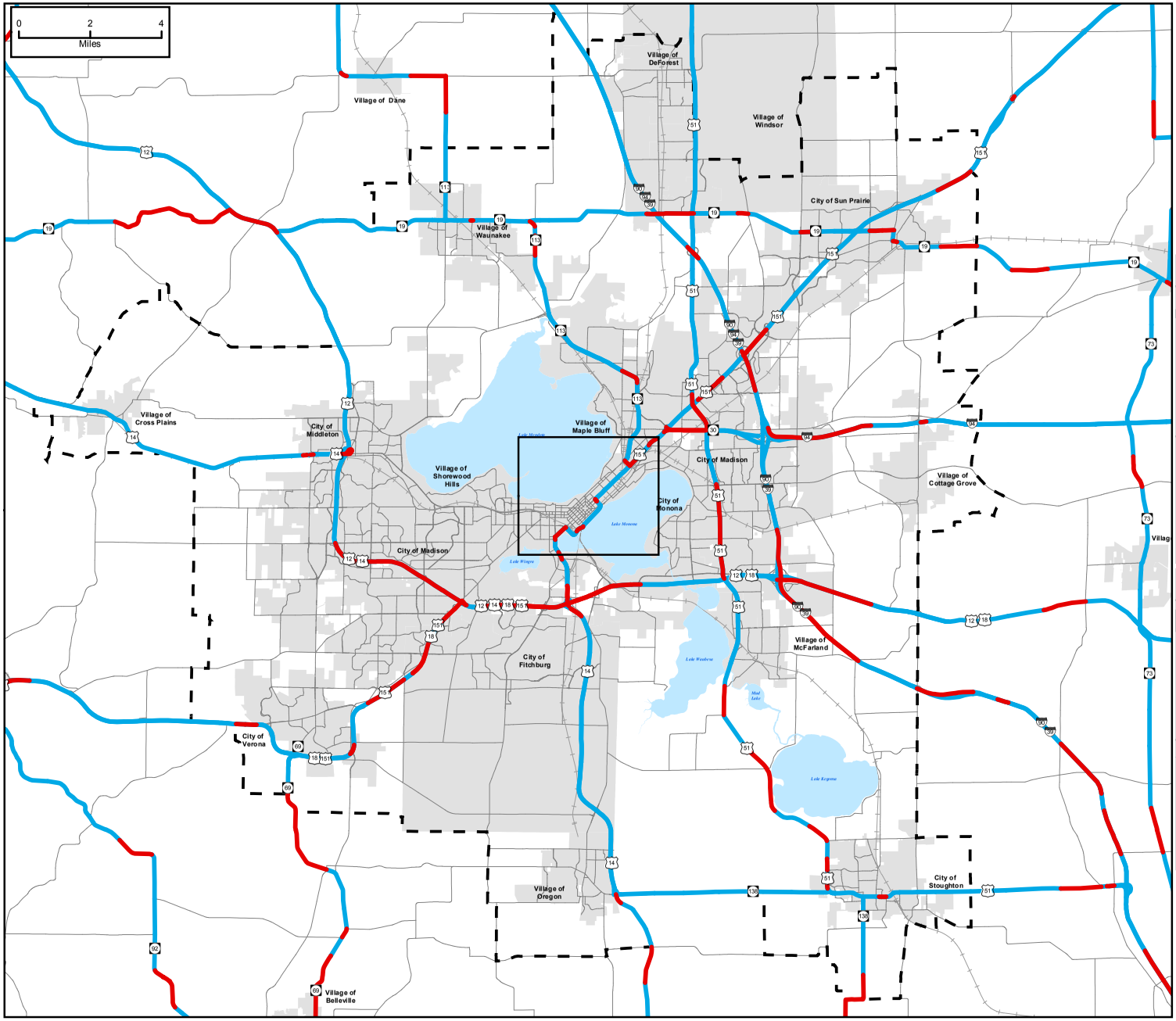
Date Revised: 11/29/2016

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Source Info
DCLIO, WisDOT, WI DNR, MATPB
Author: pjpg
Date Printed: 11/29/2016
Date Saved: 11/29/2016 1:16:00 PM
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Regional Transportation Plan 2050
Madison Area
Charting Our Course

Fatal and Serious Injury Crash Rate Summary for State Highways 2010 - 2014



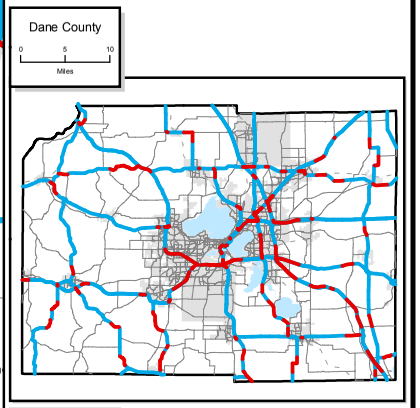
Crash Rate Significantly Higher than the Peer Group* Average

Crash Rate Not Higher than the Peer Group* Average

Arterial and Collector Roadways

MPO Boundary

* Based on Roadway Type and Characteristics





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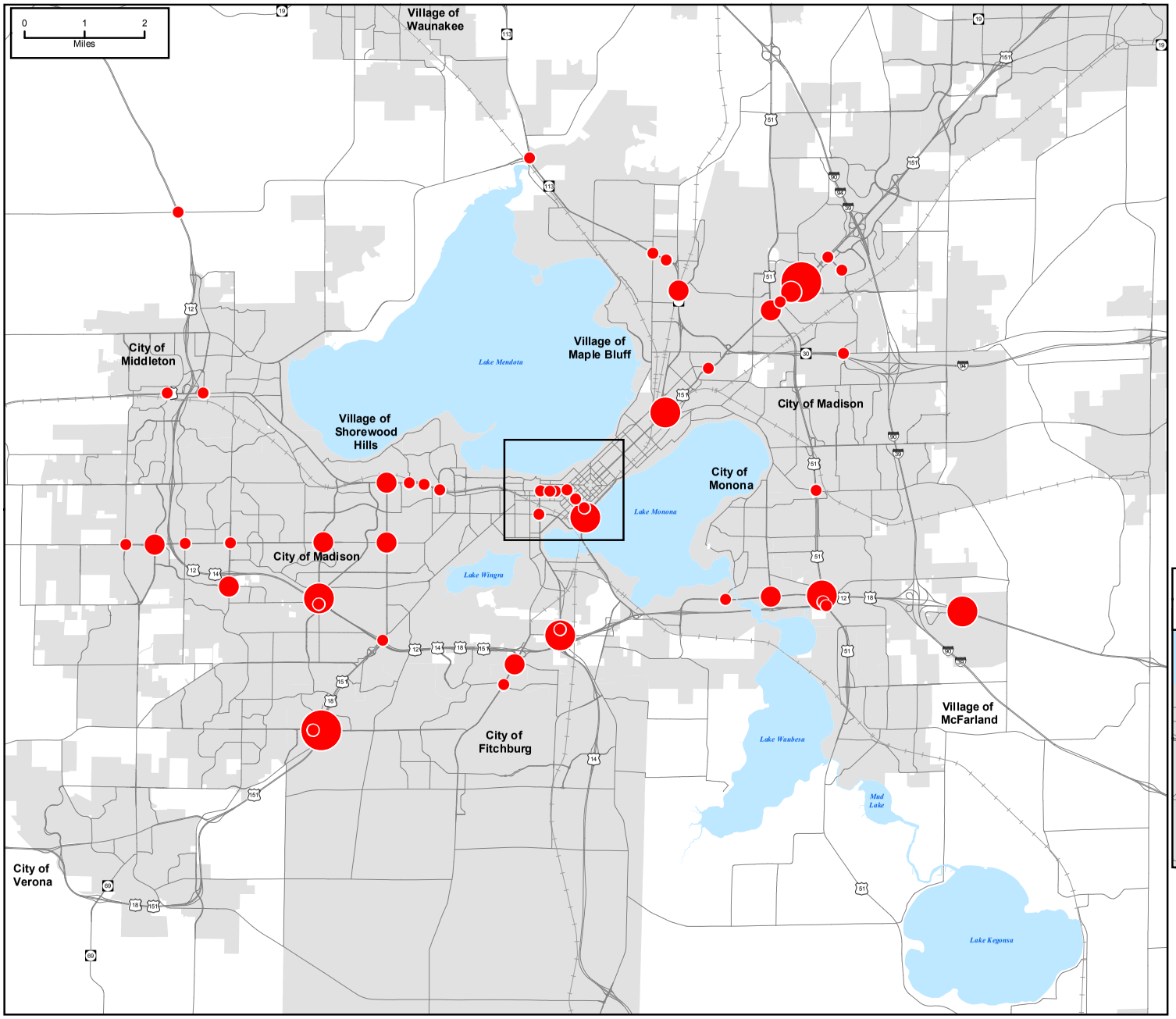
0 1 2
Miles

Date Revised: 9/20/2016

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050 Madison Area
Charting Our Course

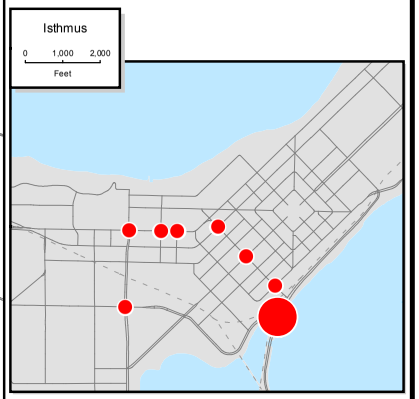
High Frequency Fatal or Serious Injury Crash Locations 2010 – 2014



Total Crashes by Intersection

- 12 - 15
- 16 - 20
- 21 - 25
- 26 - 37

Arterial and Collector Roadways



Prepared by staff to the:
Madison Area Transportation Planning Board
A Metropolitan Planning Organization (MPO)

Source Info:
Street Base: 2016 (MATPB, DCLIO)
Hydrography: 1200, 1:24,000 (WDNR)
Civil Division Limits: 2016, Annexation Records (DCLIO)
Crashes: 2010-2014 (WTCPS, City Madison Traffic Engineering)

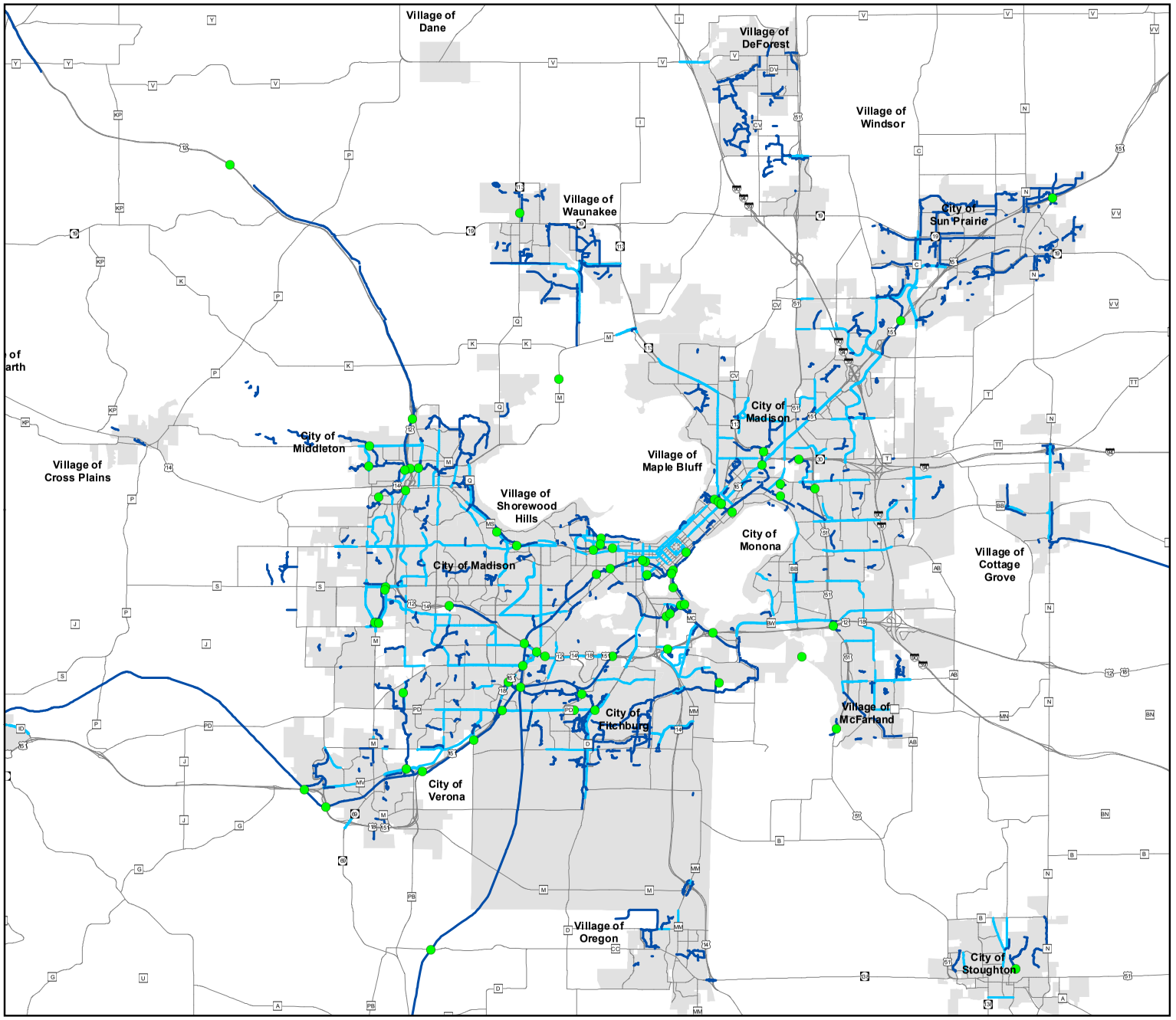
0 0.25 0.5
Miles

Date Revised: 9/20/2016

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050 Madison Area
Charting Our Course

Existing Bicycle Facilities within the Madison Metropolitan Area



Bicycle Facilities

- Existing Overpass/Underpass
- Shared-Use Path
- Bike Lane

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Madison Area T•P•B Transportation Planning Board
Metropolitan Planning Organization (MPO)

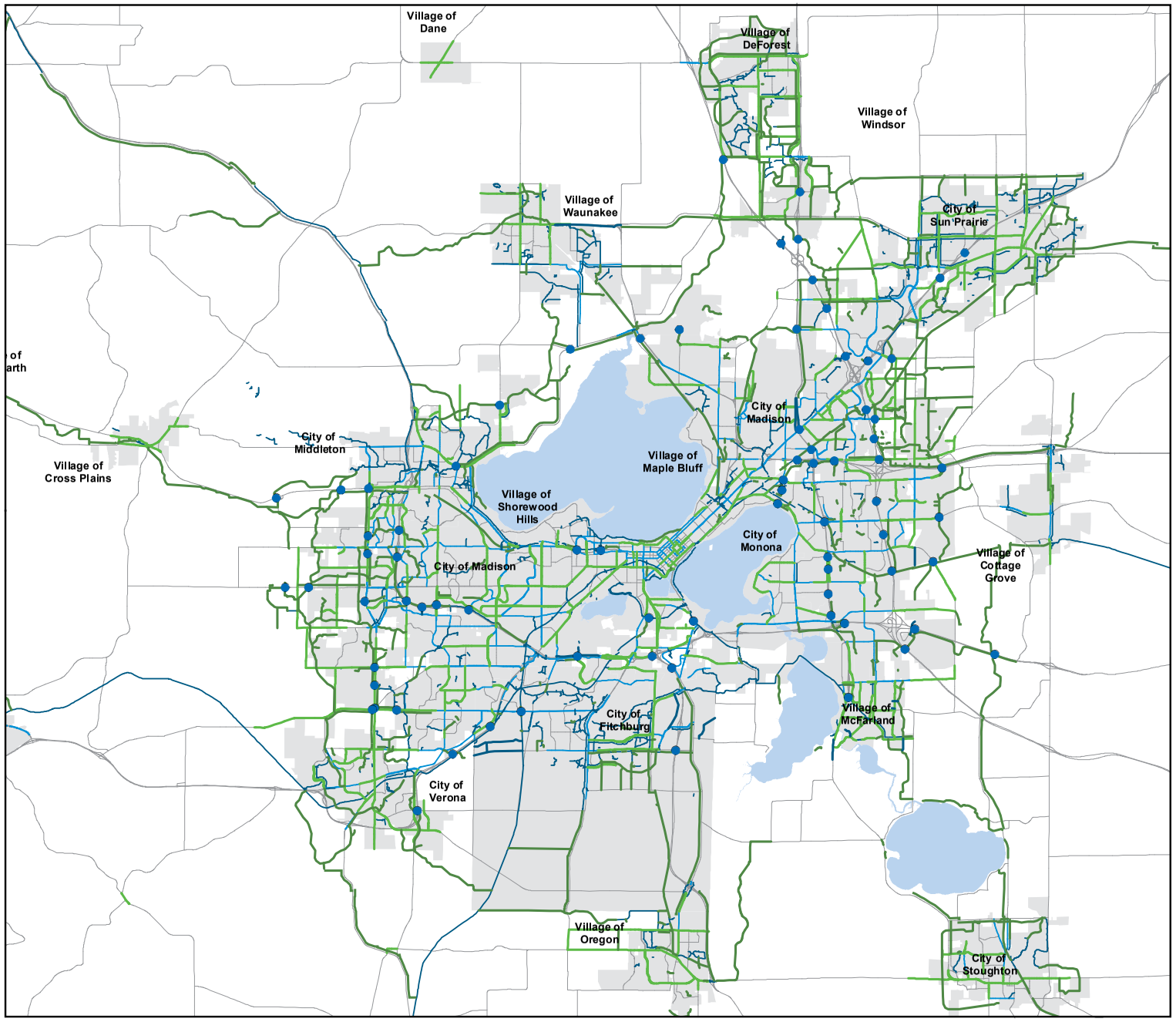
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Miles
Date Revised: 12/13/2016

Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

Source Info:
DCLIO, WisDOT, MATPB
Author: jmjs
Date Printed: 12/14/2016
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Regional Transportation Plan 2050 Madison Area
Charting Our Course

Planned Bicycle Facilities within the Madison Metropolitan Area



Planned Bicycle Facilities

- Need for New or Improved On-Street Facility *
- Planned Shared-Use Path

* The need for new or improved on-street facilities has been identified based on traffic volumes and speeds, roadway cross sections, and other characteristics. Bikeway improvements may not be feasible or practical due to competing needs for sidewalks, terraces, parking, and other right-of-way constraints.

Existing Bicycle Facilities

- Shared-Use Path
- Bike Lane

Prepared by staff to the:
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A Metropolitan Planning Organization (MPO)

Source Info:
DC LIO, WisDOT, MATPB

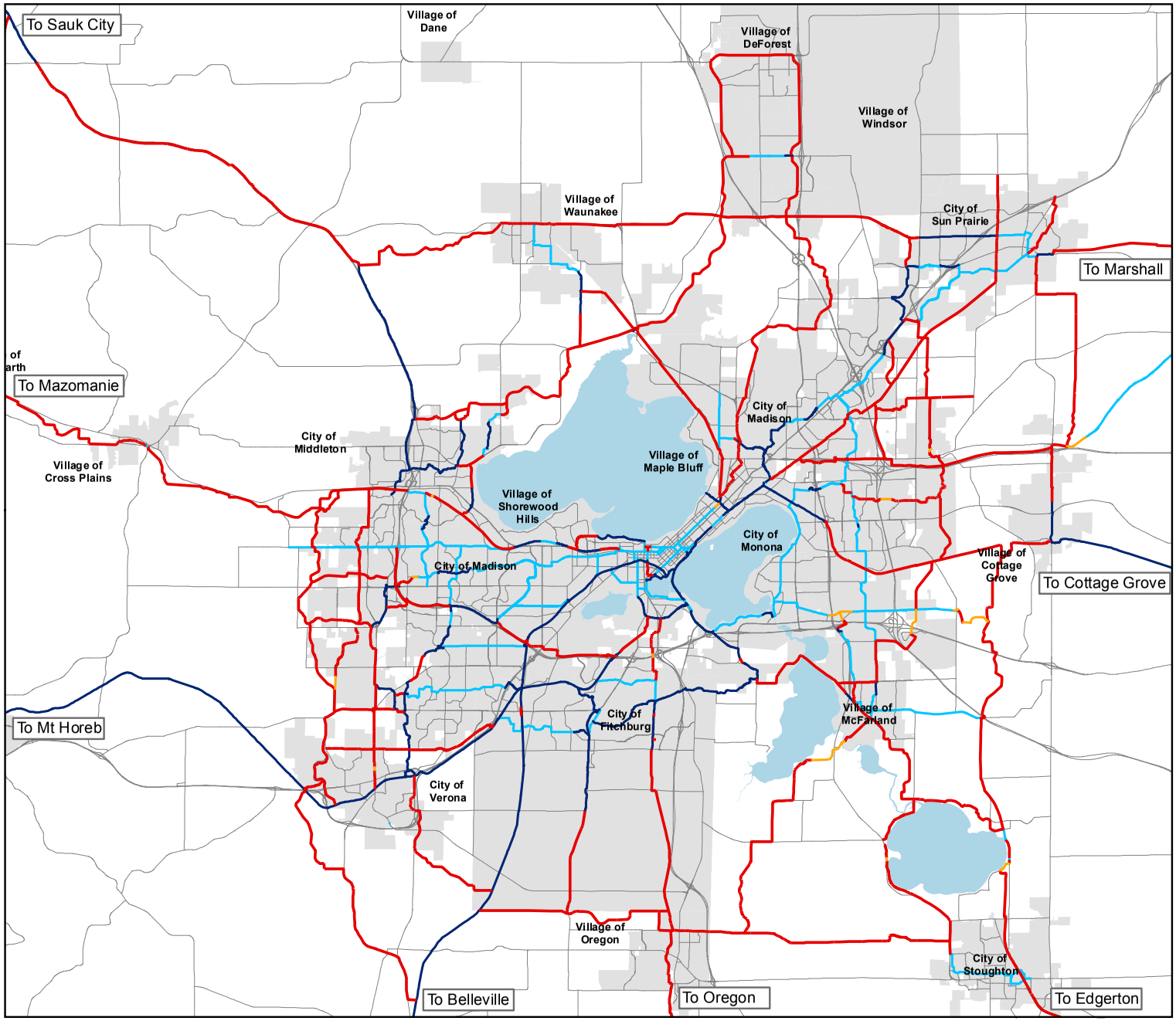
Author: jlw
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0 1.25 2.5
Miles
Date Revised: 3/14/2017

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050 Madison Area
Charting Our Course

Planned Primary Regional Bicycle Route System



Planned Primary Route System

- Existing On-Street Facility
- Existing Shared-Use Path
- Future On-Street Facility
- Future Shared-Use Path

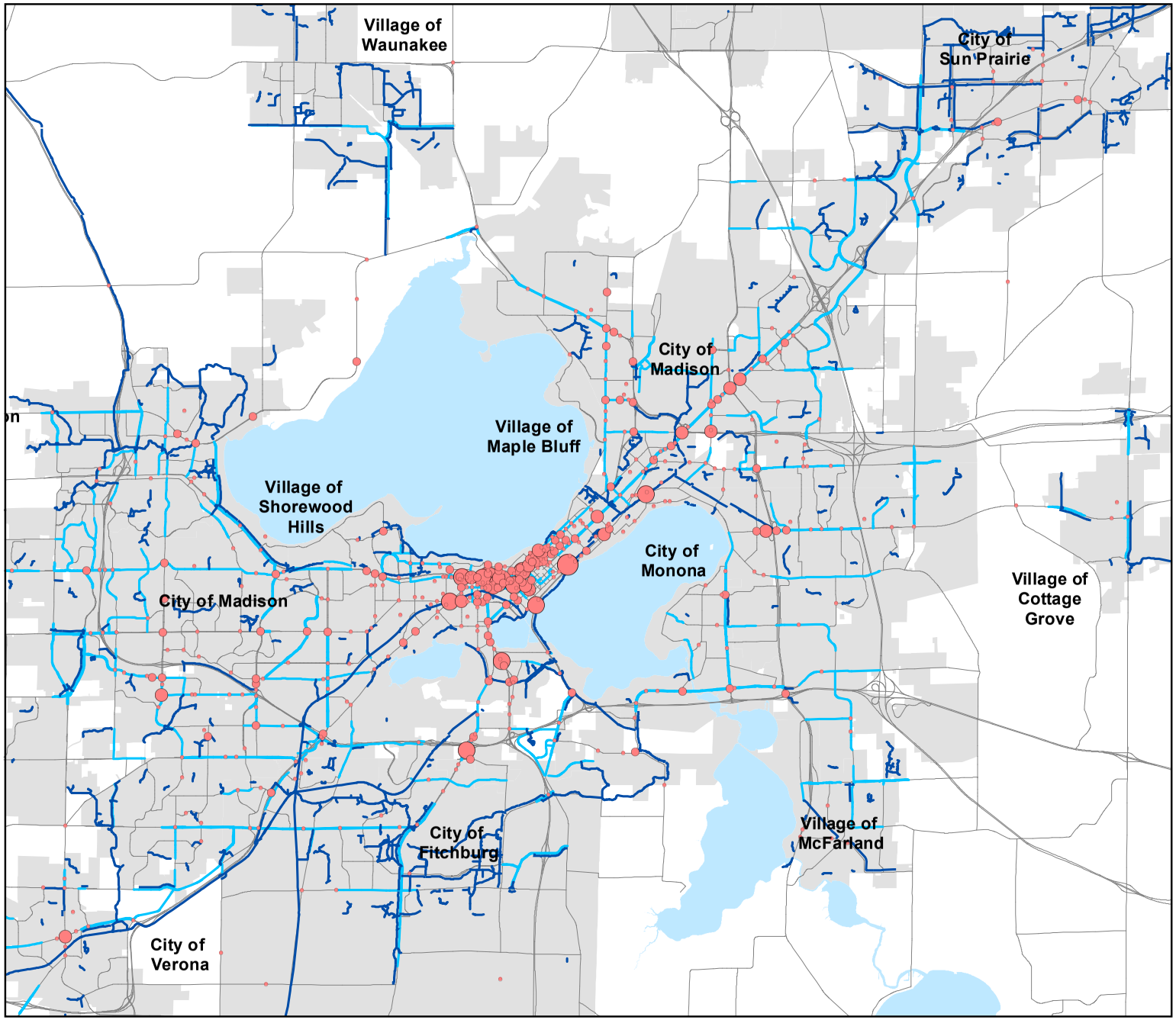
Prepared by staff to the:
Madison Area Transportation Planning Board

0 1.25 2.5
Miles
Date Revised: 12/14/2016

Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Bicycle Crashes (2008 - 2012)



Bicycle Crashes *

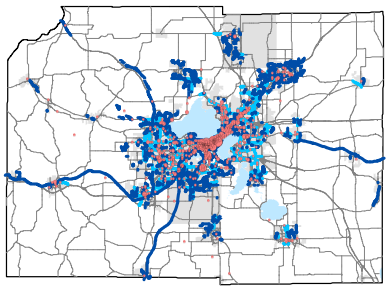
- 1
- 2 - 3
- 4 - 5
- 6 - 8
- 9 - 14

* Bicycle Crashes have been summarized at the nearest intersection.

Crash data is collected by the UW TOPS lab and City of Madison.

Bicycle Facilities

- Shared-Use Path
- Bike Lane



Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board

Source Info:
DCLG, WisDOT, MATPB, City of Madison, UW TOPS Lab

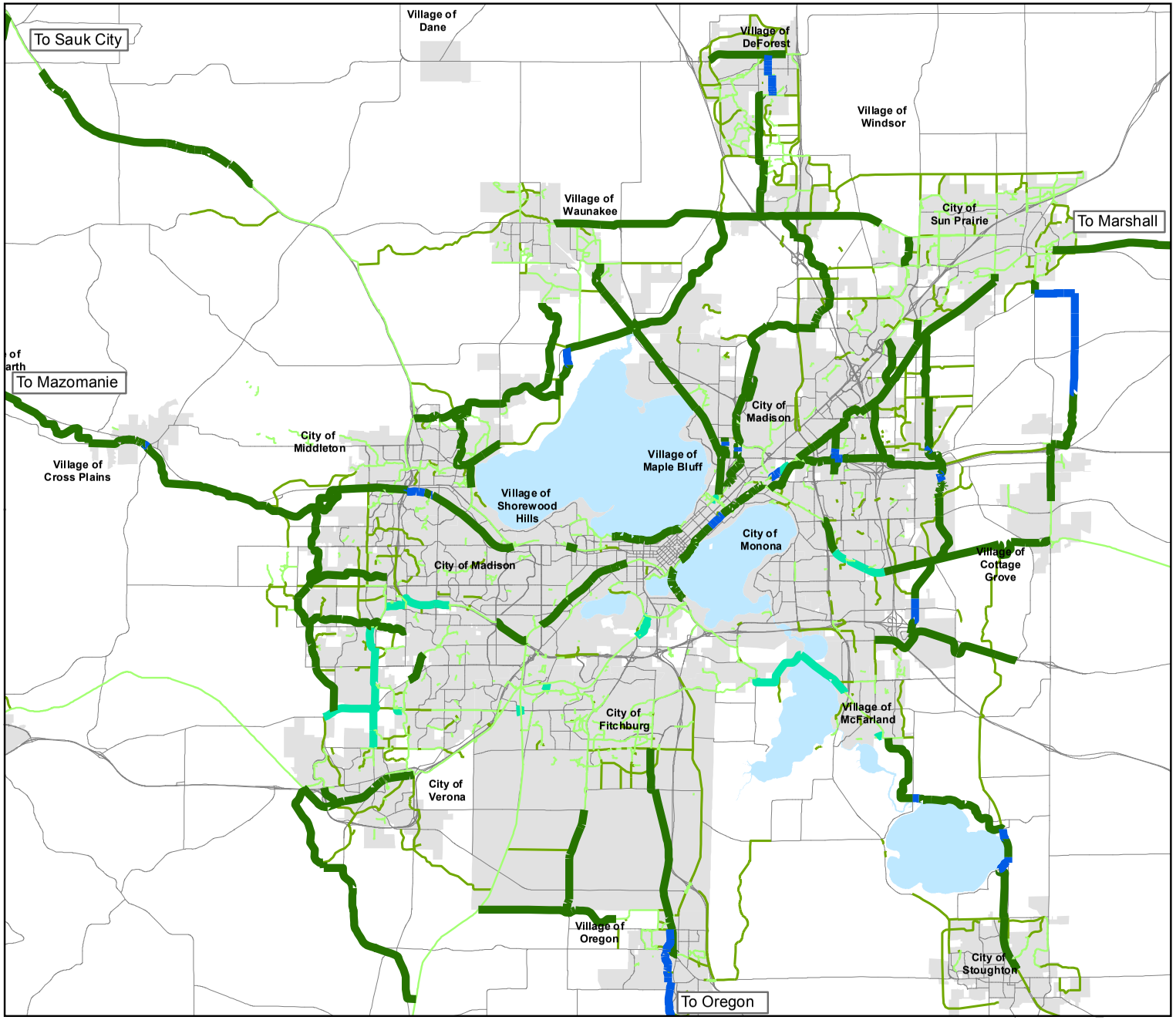
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0 0.75 1.5
Miles
Date Revised: 12/9/2016

Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Planned Priority Regional Shared-Use Paths



Planned Regional Paths

- On-Street Corridors
- Off-Street Corridors

Planned regional priority shared-use paths are routes that have important regional roles in the bicycle transportation system. They were identified in the 2015 Bicycle Transportation Plan.

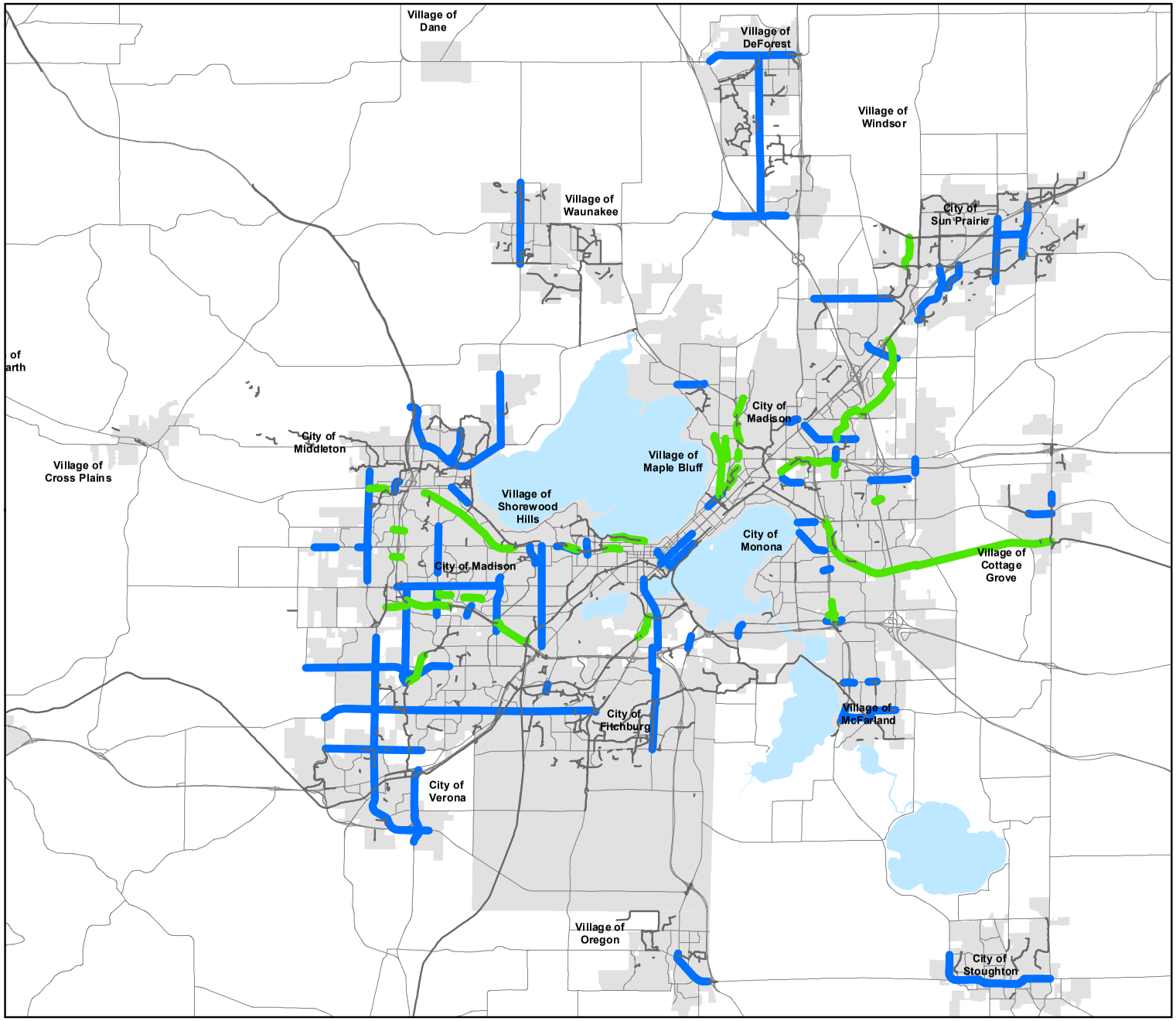
Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board

0 1.25 2.5
Miles
Date Revised: 12/14/2016

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050
Charting Our Course
Madison Area

Regional Bikeway Network Gaps and Barriers in Urban Areas



Bikeway Gaps and Barriers

- On-Street Corridors
- Off-Street Corridors

- Existing Shared-Use Paths

Prepared by staff to the:
Madison Area T • P • B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

Source Info:
DCLD, WisDOT, MATPB

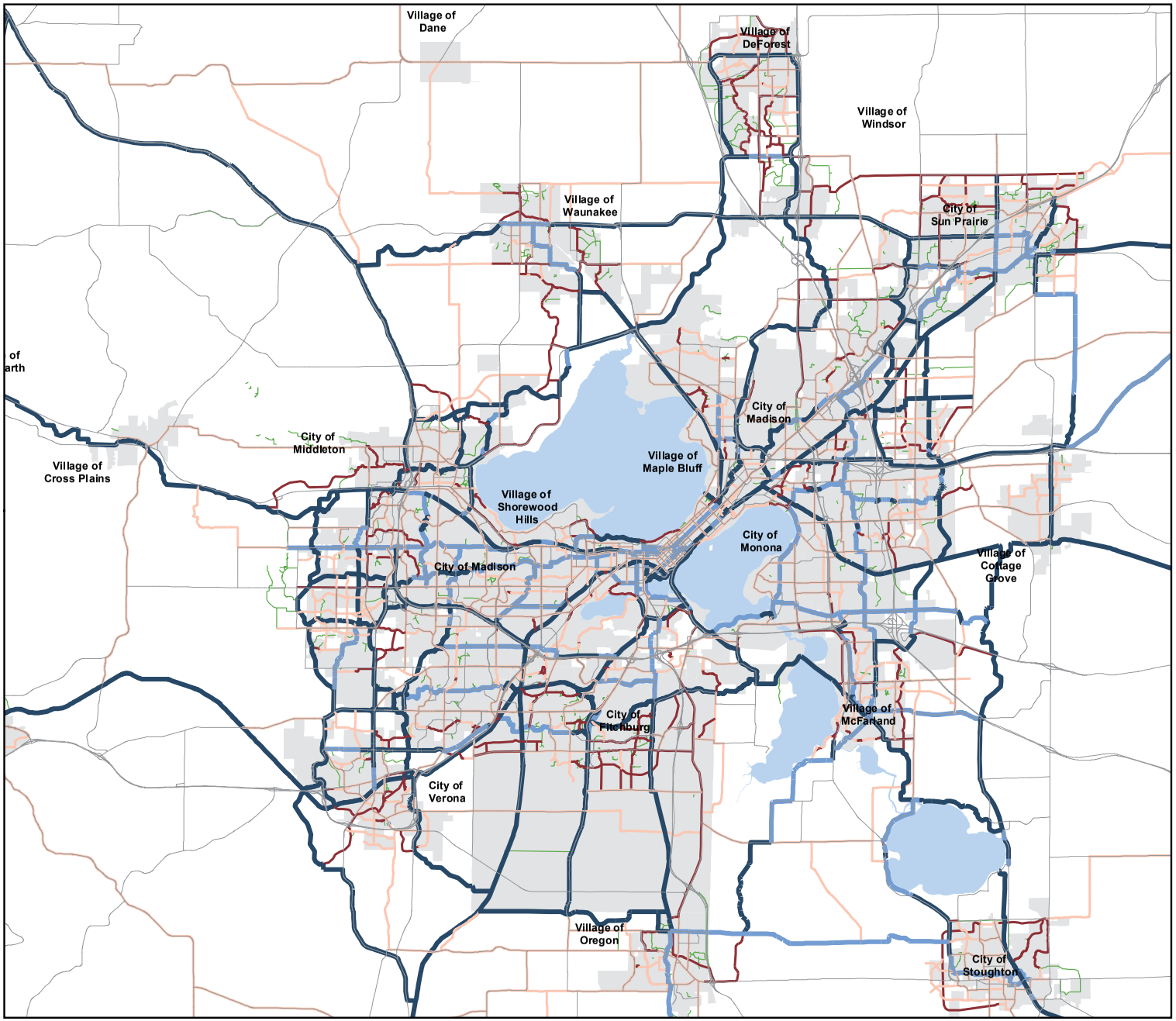
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0 1.25 2.5
Miles
Date Revised: 4/3/2017

Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

Regional Transportation Plan 2050
Charting Our Course
Madison Area

Planned Future Bicycle Network Functional Class within the Madison Metropolitan Area



Primary Bicycle Network

- Primary (Shared-Use Path)
- Primary (On Street)

Secondary Bicycle Network

- Secondary (Shared-Use Path)
- Secondary (On Street)

Other Bicycle Facilities

- Other Existing or Planned Shared-Use Paths

Prepared by staff to the:
Madison Area Transportation Planning Board

Source Info:
DCLIO, WisDOT, MATPB

Author: jbig
Date Printed: 3/17/2017
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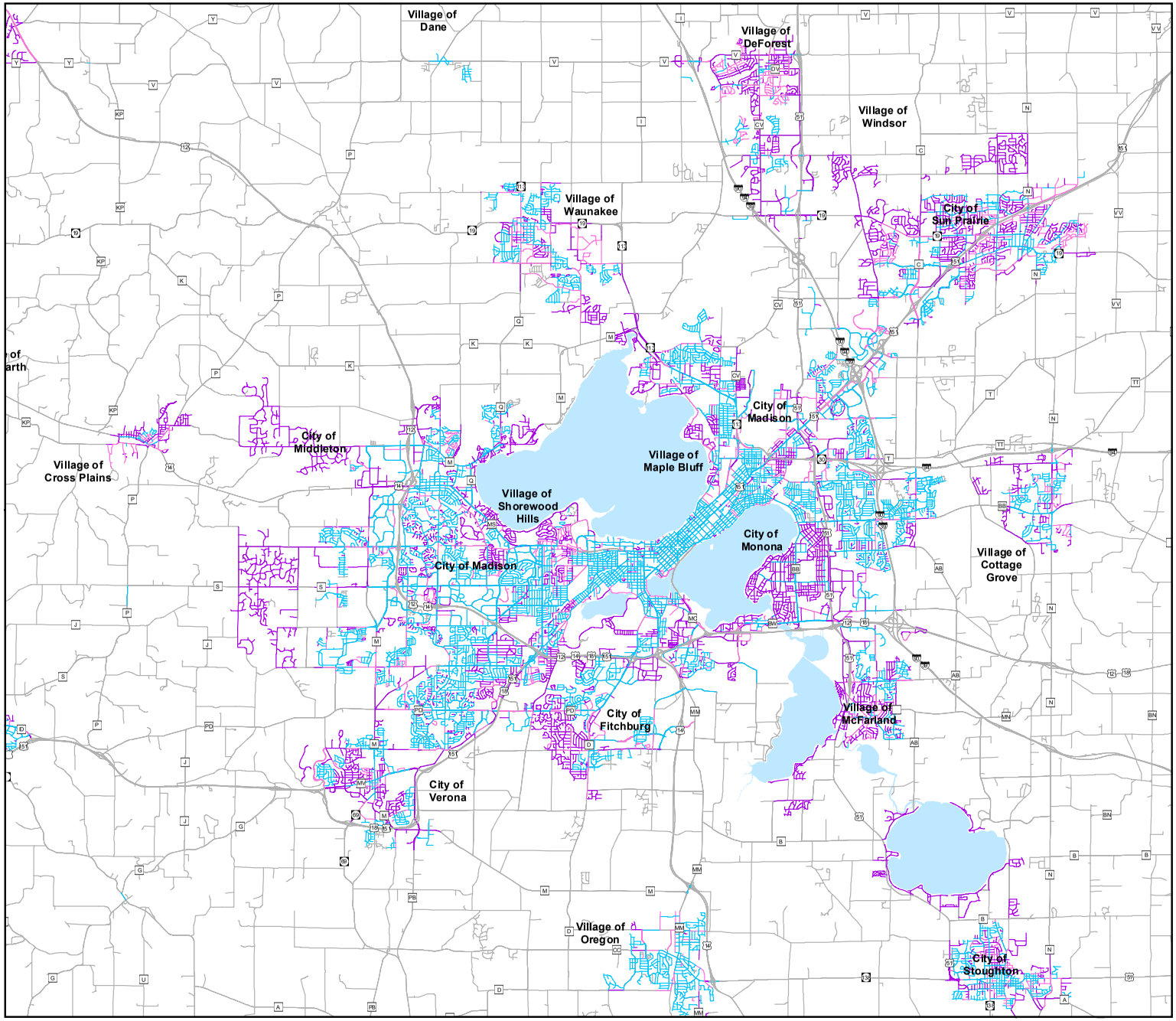
0 1.25 2.5 Miles

Date Revised: 3/14/2017

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050 Madison Area
Charting Our Course

Pedestrian Facilities within the Madison Metropolitan Area



Existing Facilities

- Sidewalk on Both Sides, or One Side Only and not Expected on the Other Side
- Urban Streets with Sidewalk on One Side
- Urban Streets with No Sidewalk
- Freeways, Rural Roads, and Streets where Sidewalk is Not Expected

Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board

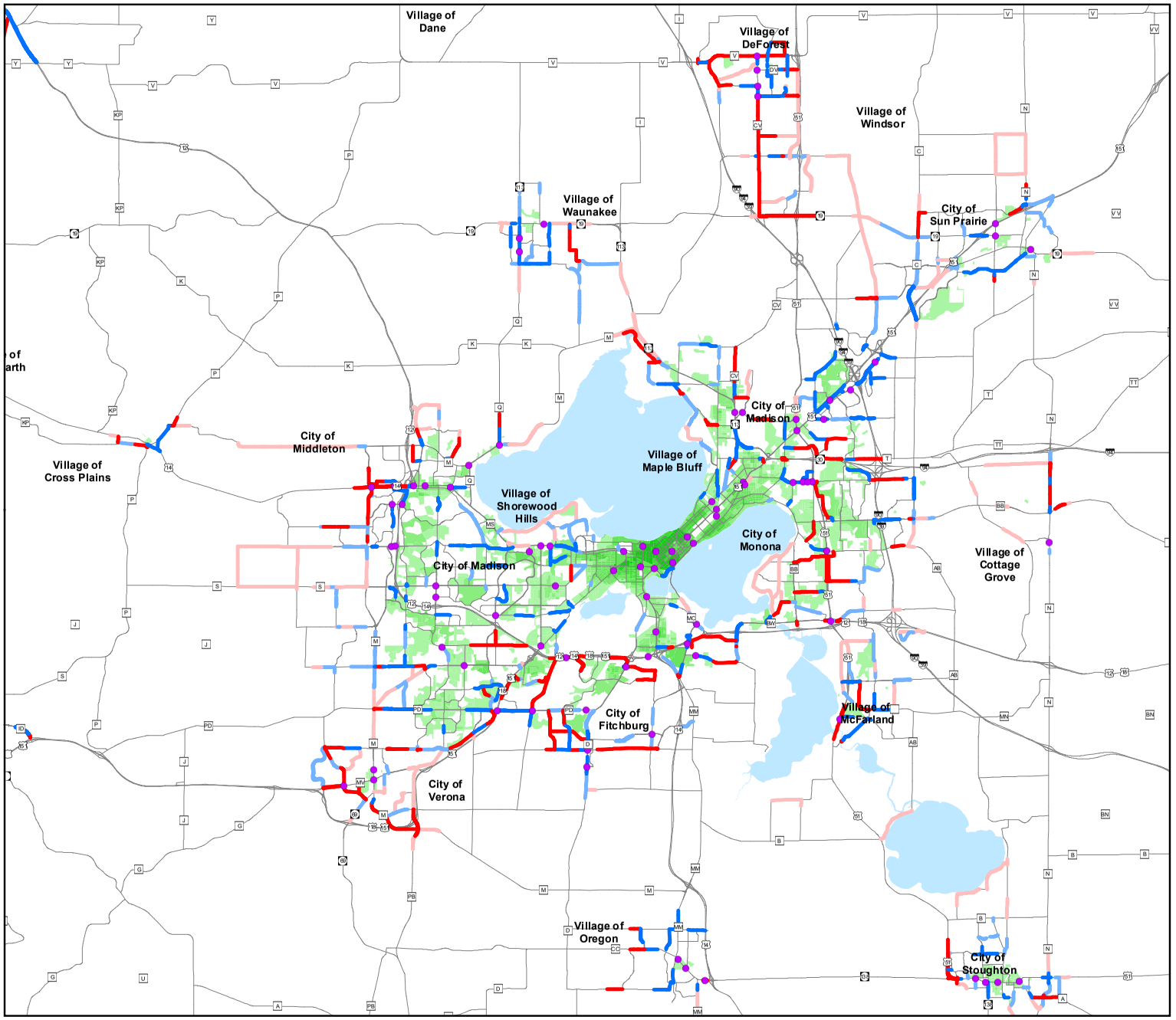
0 1.25 2.5 Miles

Date Revised: 12/9/2016

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Regional Pedestrian Network Improvement Needs



Sidewalk Needs *

- No Sidewalk - Tier 1
- Sidewalk One Side Only - Tier 1
- No Sidewalk - Tier 2
- Sidewalk One Side Only - Tier 2

Street Crossing Needs

- High Conflict Intersections

Walk Access Score **

Weighted by population to reflect pedestrian travel demand

- 0 - 20
- 21 - 30
- 31 - 40
- 41 - 55
- 56 - 70
- 71 - 100

* Sidewalk Notes:

Sidewalk condition is only shown for urban collectorand arterial roads where a sidewalk is expected. Ramps, frontage roads, and similar roads wheresidewalk is not expected are not shown.

High priority "Tier 1" corridors include urbanized streets with higher traffic speeds and volumes and a higher concentration of destinations.

** Walk Access Score Notes:

The Walk Access Score is based on the number of destinations reachable within a 60 minute walk. Destinations are weighted with a target number per category. The score is calculated using a distance decay function where the value of a destination is based on distance from the origin. The further a destination is form the origin, the less affect it has on the Walk Access Score.

Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board

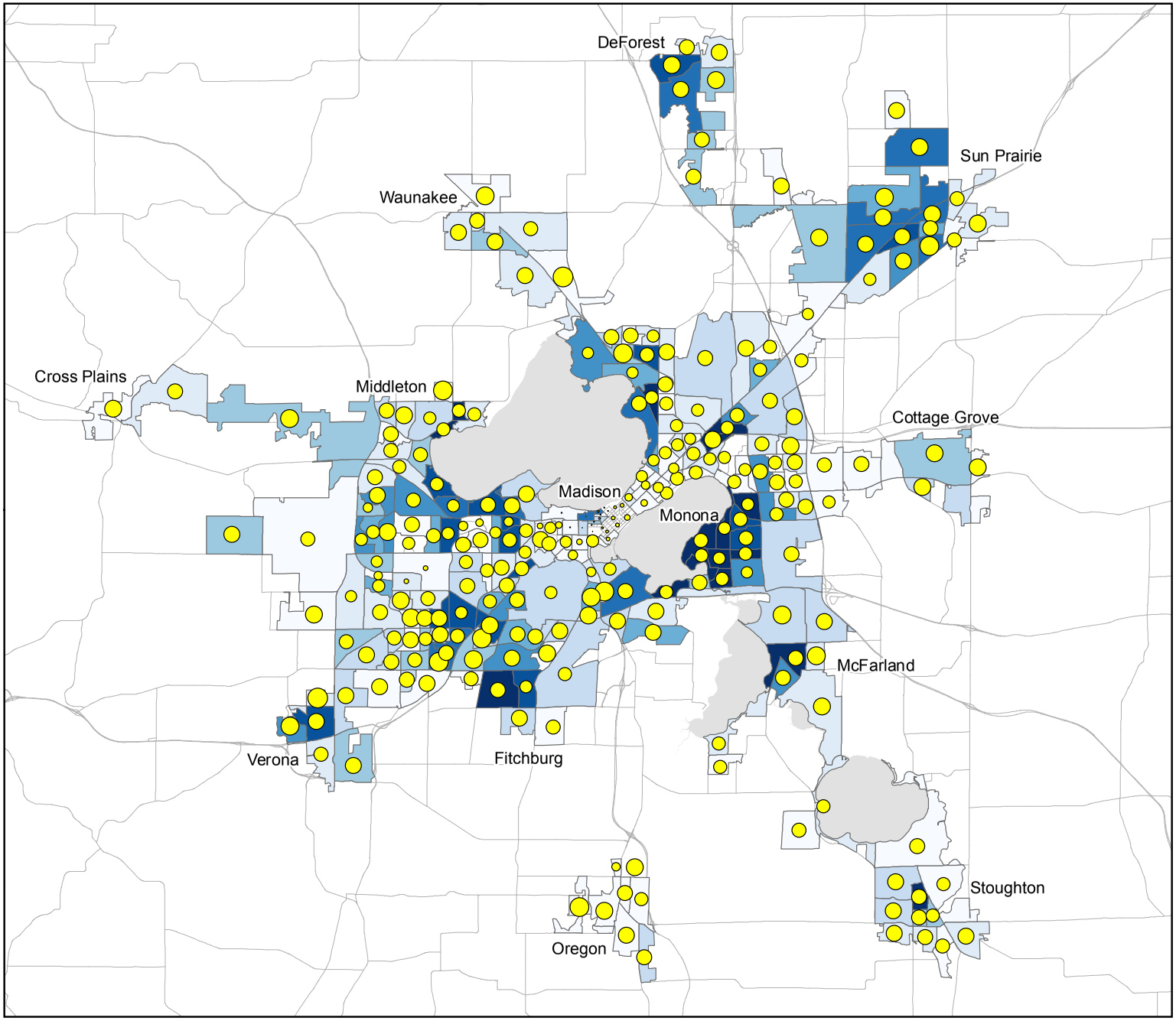
Source Info:
DCLIO, WisDOT, MATPB

0 1.25 2.5
Miles

Date Revised: 12/9/2016

Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

Sidewalk Deficiency Analysis Ages 17 and Under



Sidewalk Deficiency Analysis Ages 17 and Under

Block Groups with in Madison Urban Area, Village of Oregonand Village of Mt Horeb Urban Service Areas. Rural areasnot in analysis.

Percent Age 17 and Under

1% 5% 10% 25% 50%

Miles of Urban Street without Sidewalks per Square Mile*

0.0 - 1.0	3.1 - 4.0	6.1 - 8.0
1.1 - 2.0	4.1 - 5.0	8.1 - 11.0
2.1 - 3.0	5.1 - 6.0	11.1 - 17.2

* Principal Arterials - Interstate, Principal Arterials - Other Freeways, Restricted Access, and Ramps Excluded.

Prepared by staff to the: Madison Area T•P•B Transportation Planning Board

Source Info:
Street Base: 2016 (MATPB, DCLIO).
Hydrography: 12,000, 1:24,000 (WDNR).
Civil Division Limits: 2016, Annexation Records (DCLIO).

Author: dfg
Date Printed: 2/7/2017
Date Saved: 2/7/2017 3:30:04 PM
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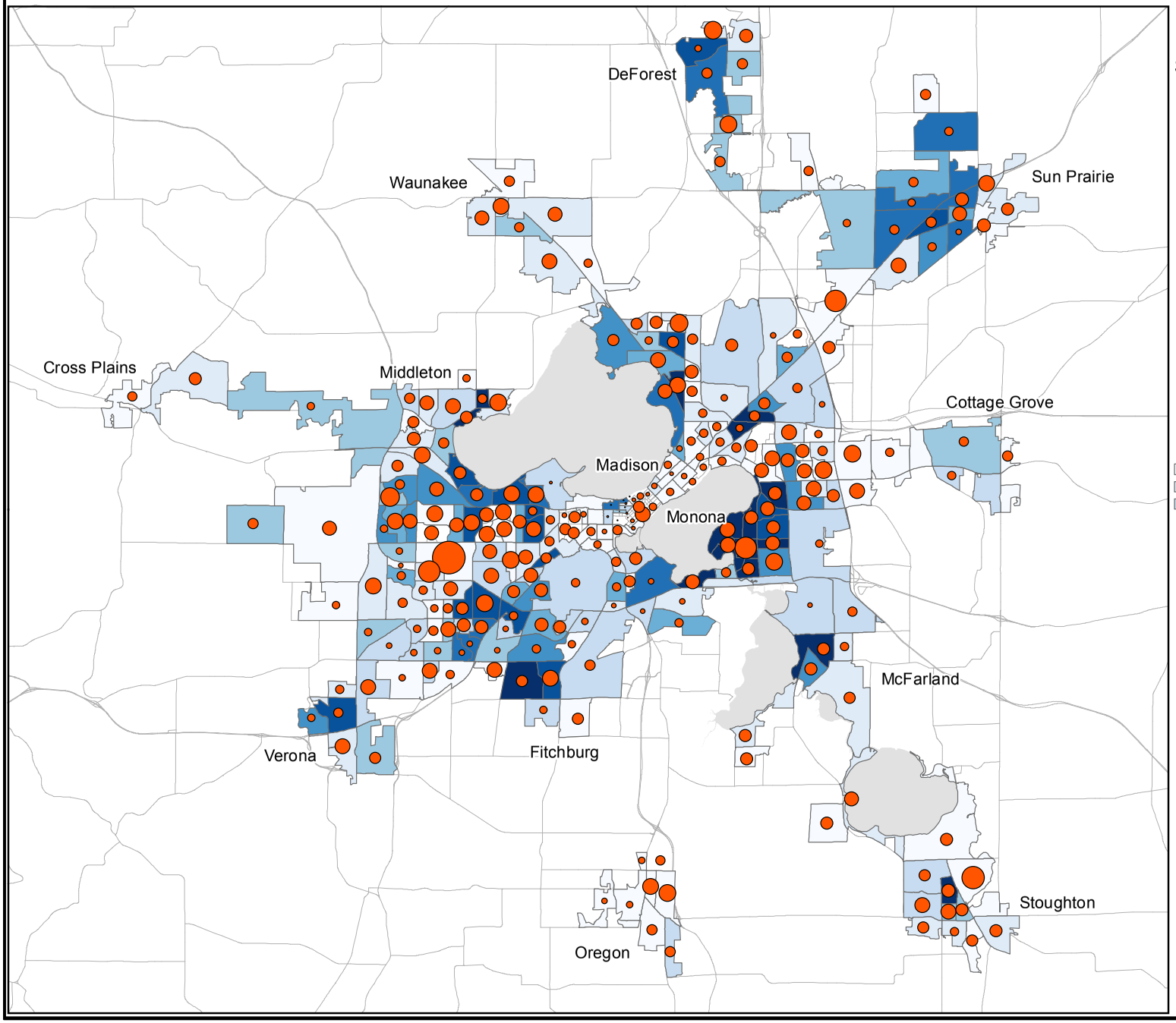
0 0.9 1.8 Miles

Date Revised: 2/27/2017

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050 Madison Area
Charting Our Course

Sidewalk Deficiency Analysis Ages 67 and Over



Sidewalk Deficiency Analysis Ages 67 and Over

Block Groups with in Madison Urban Area, Village of Oregon and Village of Mt Horeb Urban Service Areas. Rural areas not in analysis.

Percent Age 67+

1%
5%
10%
25%
50%
75%
100%

Miles of Urban Street without Sidewalks per Square Mile*

0.0 - 1.0	3.1 - 4.0	6.1 - 8.0
1.1 - 2.0	4.1 - 5.0	8.1 - 11.0
2.1 - 3.0	5.1 - 6.0	11.1 - 17.2

* Principal Arterials - Interstate, Principal Arterials - Other Freeways, Restricted Access, and Ramps Excluded.

Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board

Source Info:
Street Base: 2016 (WATRS, DCLIO).
Hydrography: 12/00, 1:24,000 (WDNR).
Civil Division Limits: 2016, Annexation Records (DCLIO).

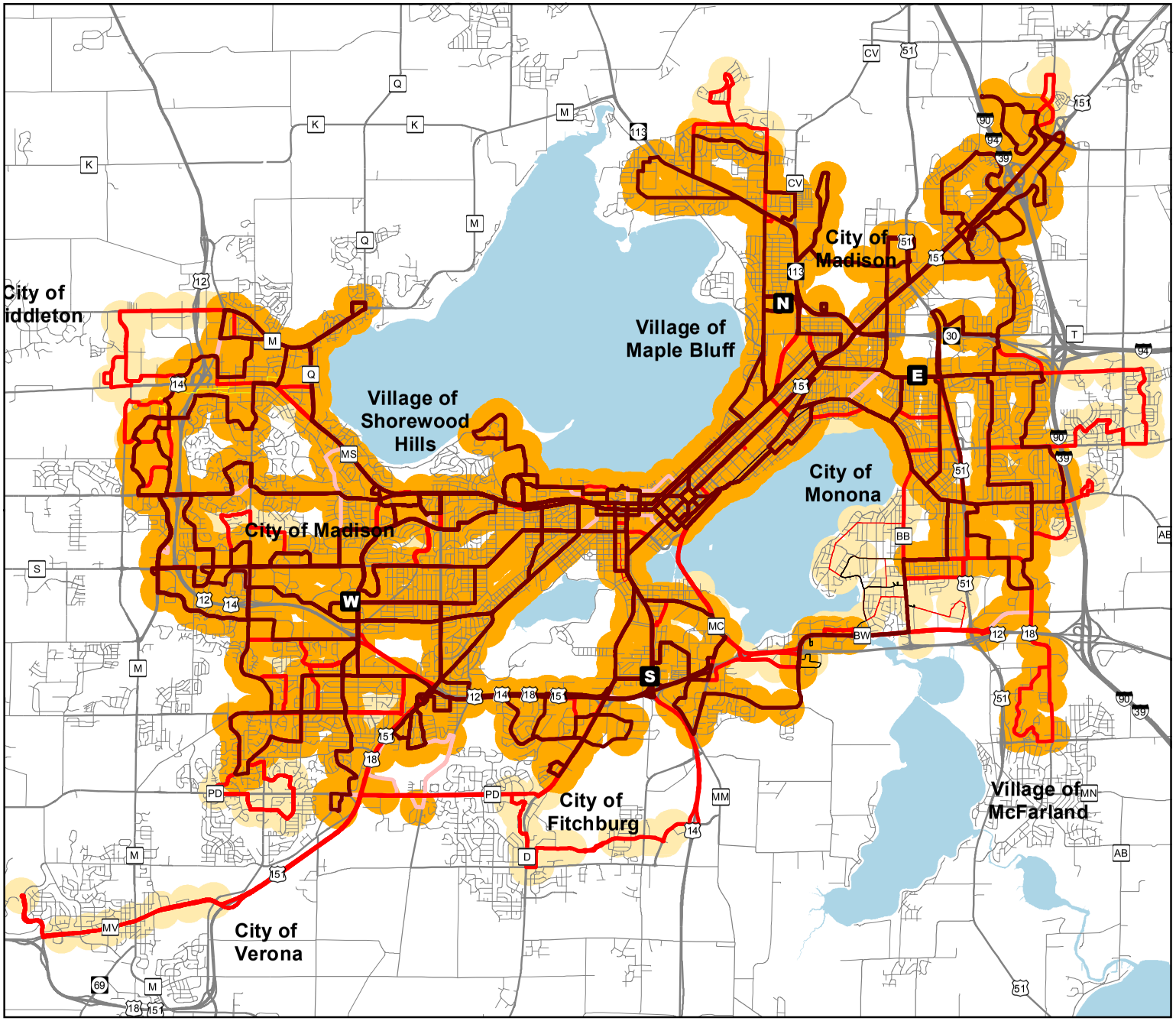
0 0.85 1.7
Miles

Date Revised: 2/27/2017

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Transit Service Area
Metro Transit, 2016



Transfer Point

Service

Service Generally Throughout the Day

Service Peak Periods Only

Service Limited / Weekends Only

Service Areas

Weekday Peak and Off-Peak Service

Weekday Peak Service Only

Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board
Metropolitan Planning Organization (MPO)

0 0.5 1 Miles

Date Revised: 4/17/2017

Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

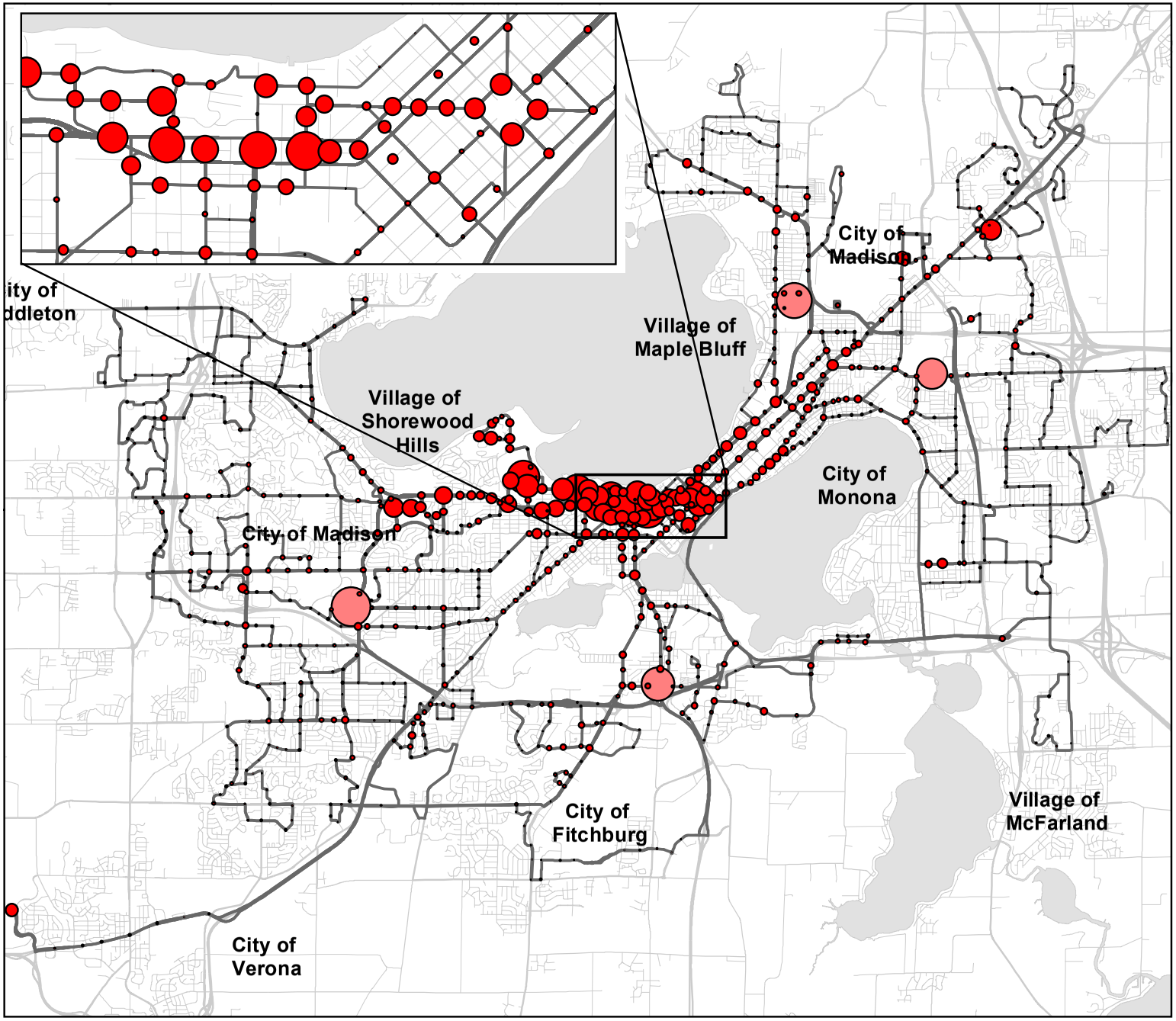
Source Info:
DCLIO, WisDOT, MATPB

Author: jbb
Date Printed: 4/17/2017
Date Saved: 4/17/2017 11:18:36 AM
Path: M:\MPO_GIS\00_Data\Common\RTP_2050\document Maps\Map book\Transit\1_Transit Service Area.mxd

Regional Transportation Plan 2050 Madison Area
Charting Our Course

Metro Transit Ridership by Intersection

Routes 1 to 84, March 2016



Average Weekday Boardings shown as proportional circles*

- 1
- 10
- 50
- 100
- 1,000
- Transfer Point
- Existing Bus Service

*Ridership data is from March1-3, 8-10, and 15-17.

Excludes supplemental school service.

Intersections combined on one-way pairs.

Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board

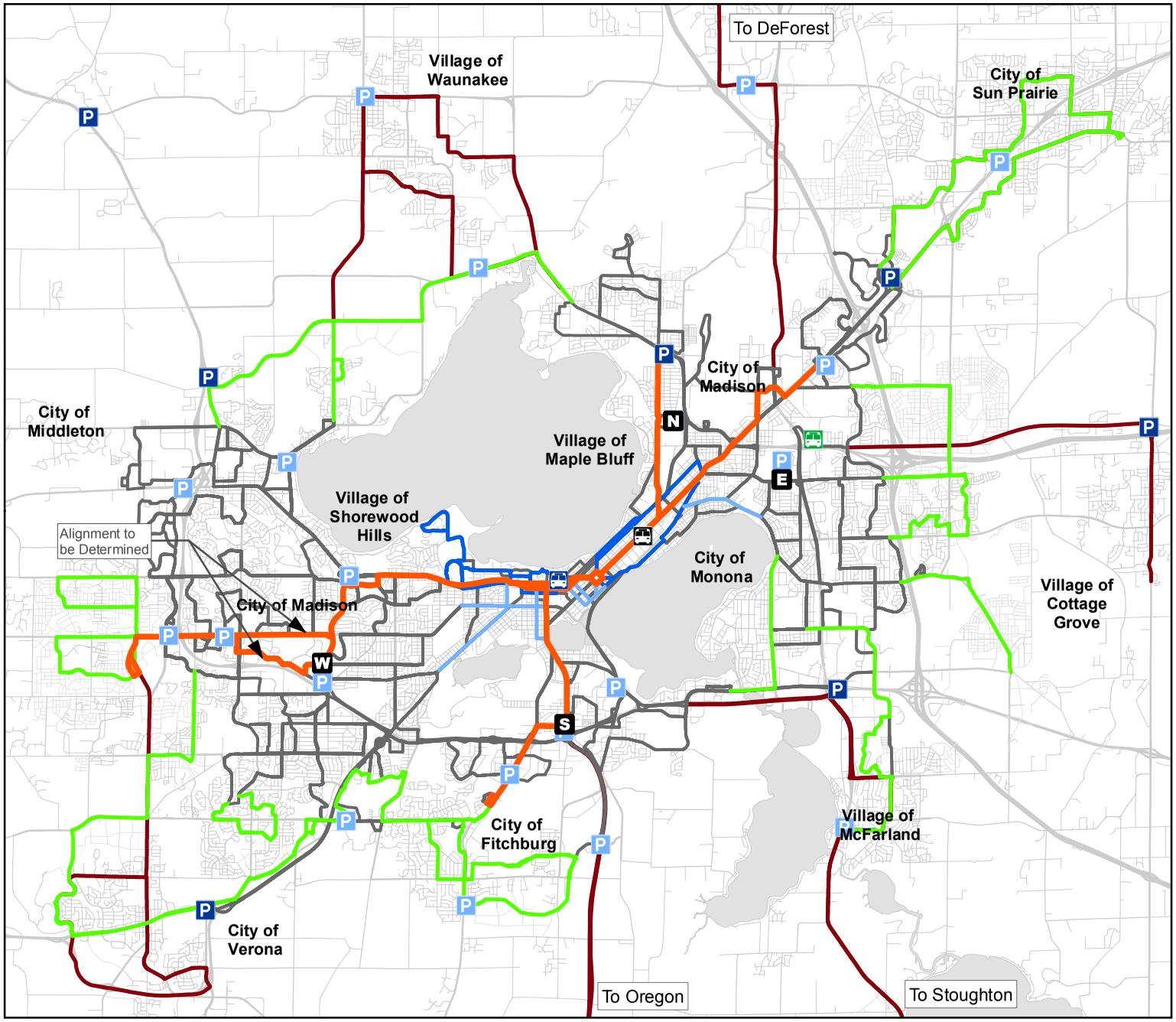
Source Info:
DCUO, WisDOT, MATPB

Miles
Date Revised: 12/14/2016

Lambert Conformal Conic Projection
WISCRS-Dane, NAD 83(91)

Regional Transportation Plan 2050 Madison Area
Charting Our Course

Future Planned Regional Transit Service Network

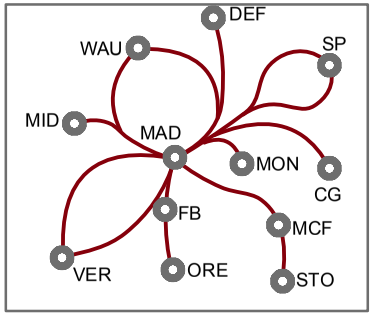


- Existing Transit Service
- Existing Frequent Service*
- Future Frequent Service*
- Future All-Day Service
- Future Bus Rapid Transit
- Future Regional Express Service
- Existing Transfer Point
- Existing Bus Maintenance Facility
- Future Bus Maintenance Facility
- Future Intercity Bus Terminal
- Existing Park and Ride**
- Future Park and Ride**

* Frequent local service is local bus service about every 15 minutes or better throughout the majority of the weekday service day, or about from 6:00 am to 6:00 pm.

** The park-and-ride lots shown are, or are plannedto be, public parking lots where users park and use transit or carpool to their final destination. Lots serving shared-use paths are not shown.

Future Regional Commuter Service



Prepared by staff to the:
Madison Area Transportation Planning Board

Source Info:
Street Base: 2017 (DCLIO).
Planned Transit: 2017 (MAPTB).

Author: JMW
Date Printed: 2/9/2017
Date Saved: 2/9/2017 8:45:01 AM
Path: M:\MPO_GROUP\...\Future Planned Transit.mxd

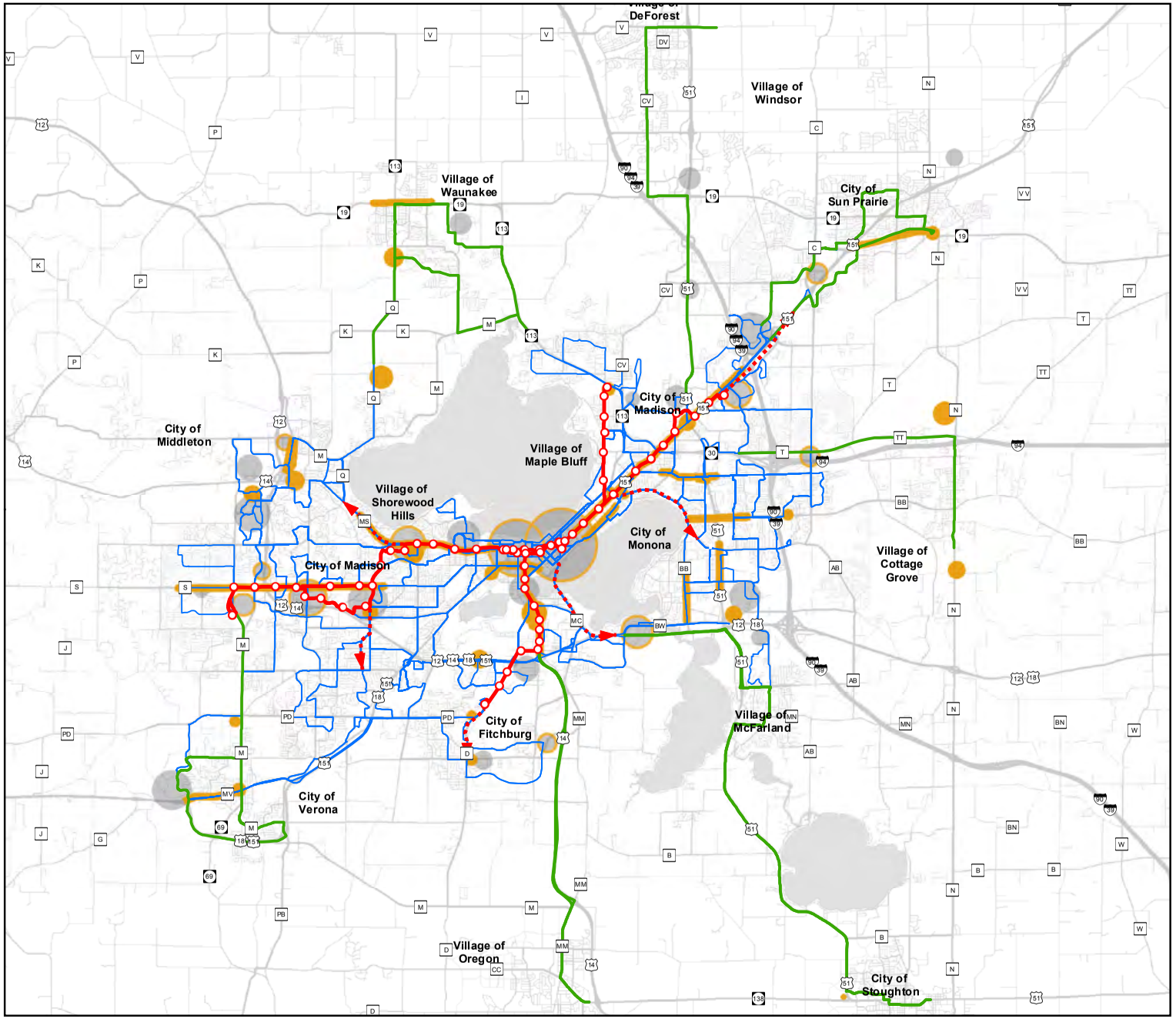
0 0.75 1.5 Miles

Date Revised: 2/9/2017

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Existing and Planned Employment/Activity Centers And Transit Corridors



- Bus Rapid Transit Stations
- Future BRT Extension
- BRT
- Future Regional Express Service
- Local Bus Routes (2050)

2050 Regional Employment and Activity Centers

- Employment and Activity Centers
- Employment Centers
- Activity Centers and Corridors

Prepared by staff to the:
Madison Area Transportation Planning Board
A Metropolitan Planning Organization (MPO)

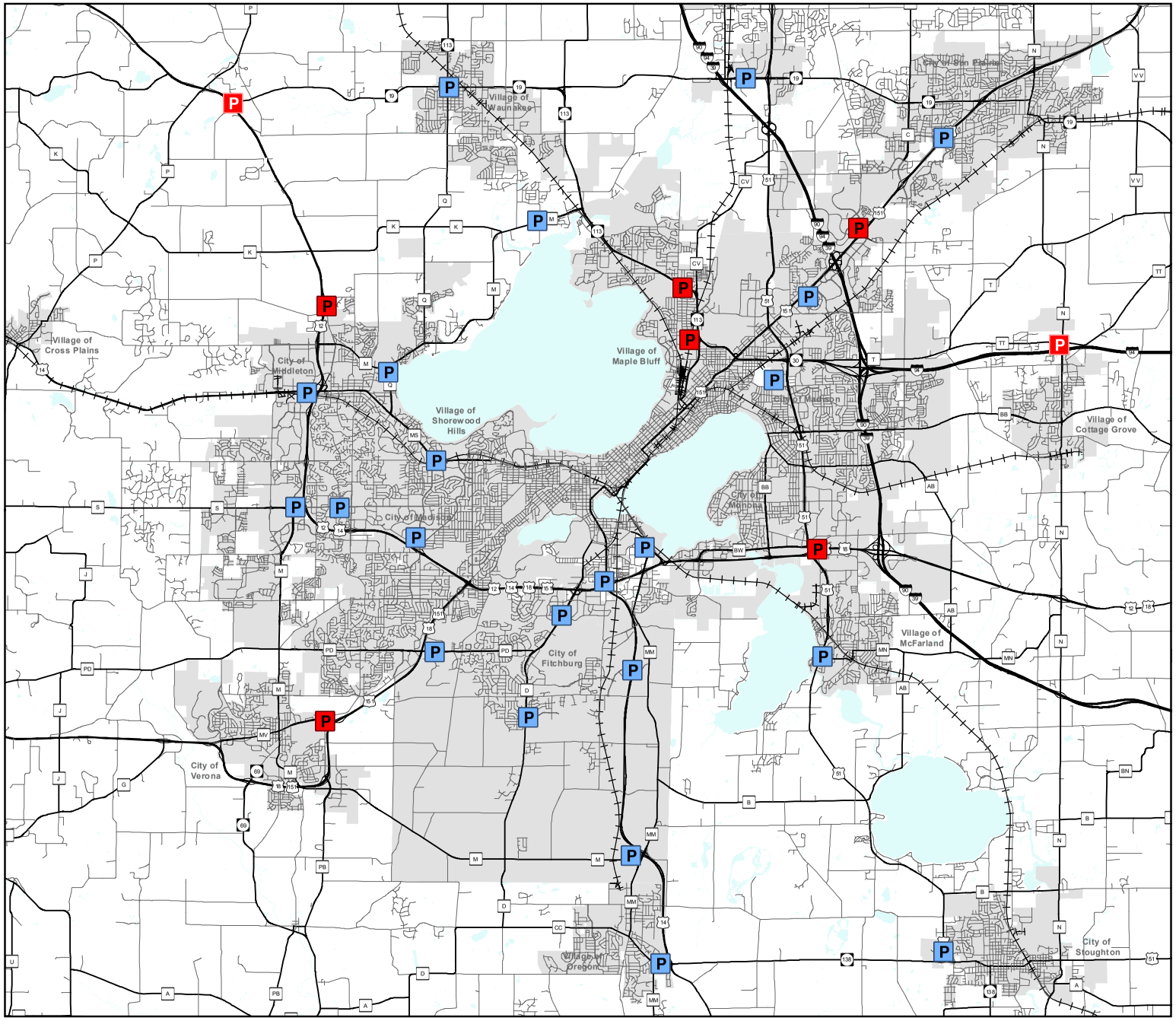
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DCLIO, WisDOT, MATPB, City of Madison
Author: jmuhr
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Path: M:\MPO_DOCS_Data\Common\RTP_2050\Document Maps\Maps to use\Transit_Regional Transit Corridors.mxd

0 1.25 2.5
Miles
Date Revised: 4/4/2017

Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

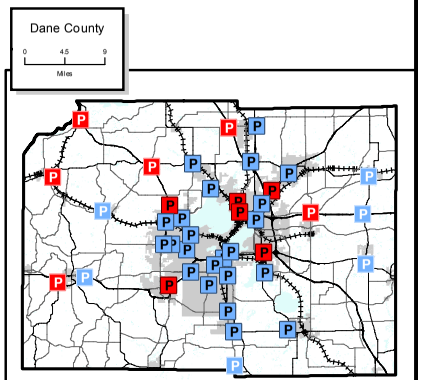
Regional Transportation Plan 2050
Madison Area
Charting Our Course

Existing and Future Park and Ride System



- Existing park and ride lot with transit service
- Existing park and ride lot, carpool
- Planned park and ride lot with transit service
- Planned park and ride lot, carpool
- Rail

* Planned indicates locations that are in general areas of priority, but which have NOT had formal discussions or agreements as part of a WisDOT improvement project.



Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board

Source Info:
Park and Ride Lots (MATPB).
Street Base (DCLIO).
Functional Classifications (MATPB, WDOT).
Hydrography (WIDNR).
Civil Division Limits (DCLIO).

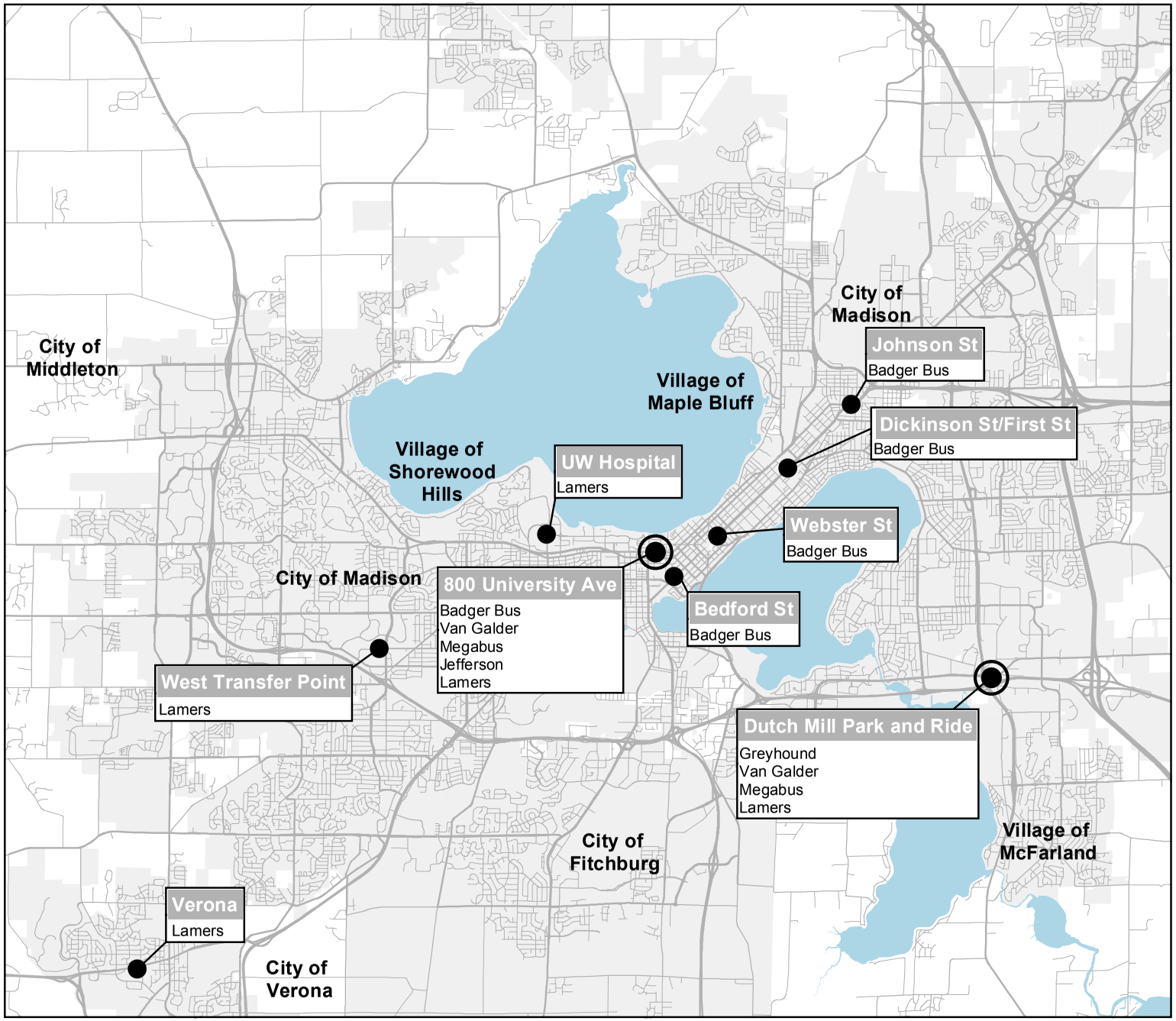
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0 1 2
Miles
Date Revised: 12/14/2016

Lambert Conformal Conic Projection
WISCRS-Dane, NAD 83(91)

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Intercity Bus Stops in the Madison Area



Major Intercity Bus Stop

Minor Intercity Bus Stop

Prepared by staff to the:
Madison Area
T • P • B
Transportation Planning Board
Metropolitan Planning Organization (MPO)

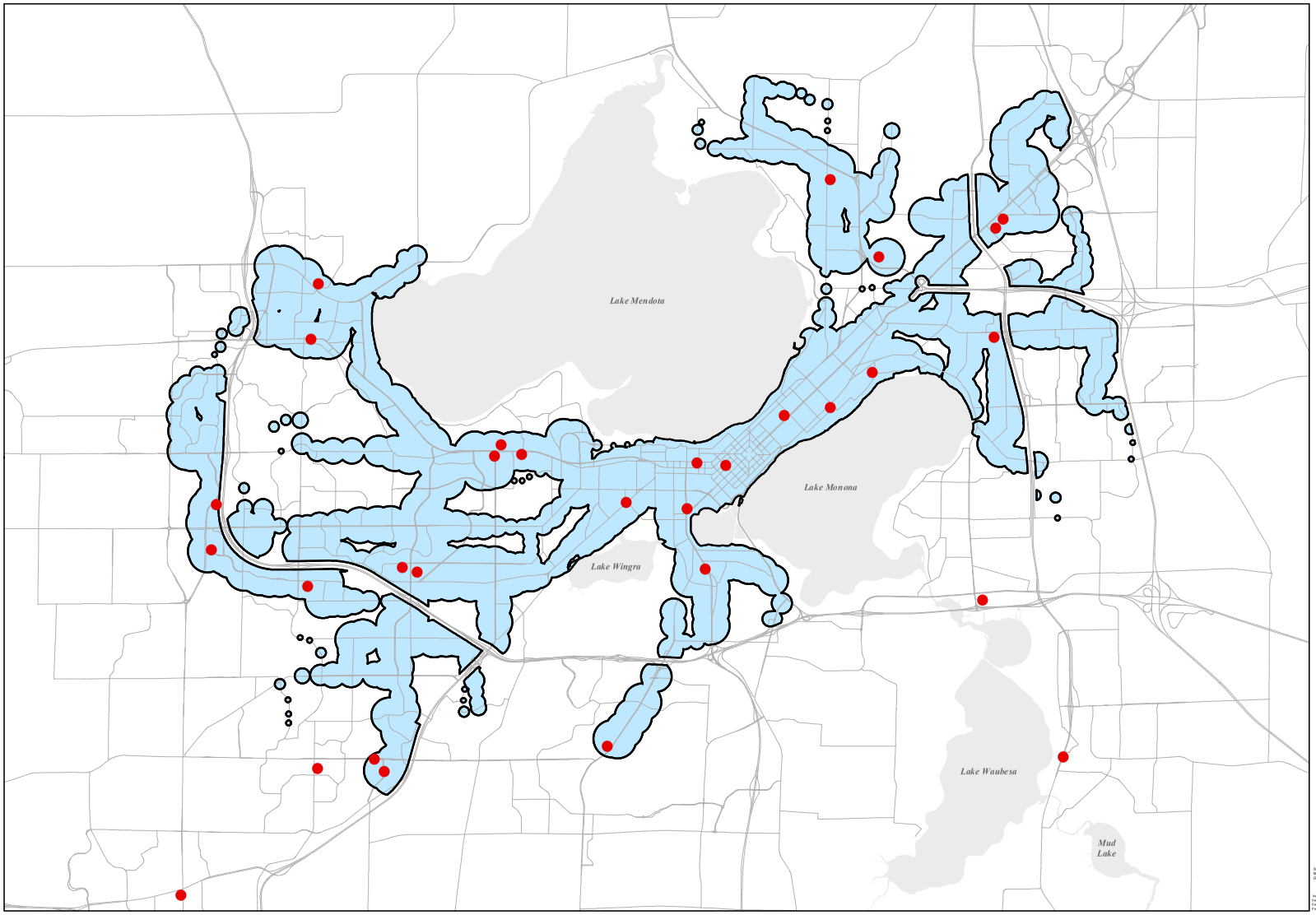
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Date Revised: 12/14/2016

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DCLIO, WisDOT, MATPB
Author: dcg
Date Printed: 12/14/2016
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Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

Regional Transportation Plan 2050 Madison Area
Charting Our Course

15-Minute Transit Accessible Areas
Grocery Store



Areas accessible within a 15-minute bus ride from the points shown.

Weekday Mid Day

- Full Service Grocery Store
- 15 Minute Travel Time

Notes:

Accessible areas are based on the shortest travel time from the points shown leaving between 11 am and 1 pm.

Walking distances are straight-line paths regardless of the pedestrian network and obstacles that may exist and cannot exceed 1/4 mile.

Travel times are based on Metro Transit bus schedules effective August 28, 2016, not including supplemental Sunday service.

Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board

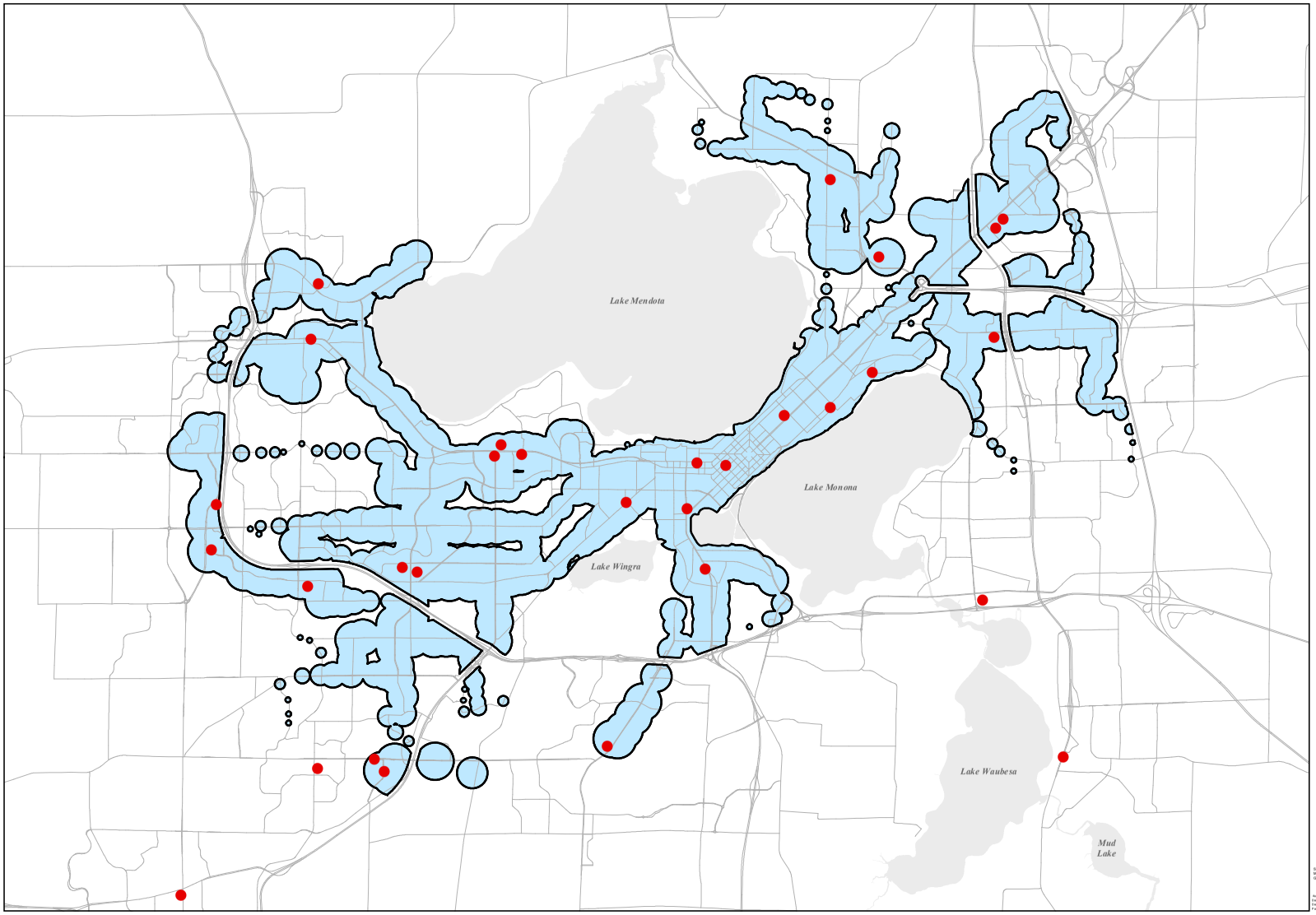
0 0.5 1 Miles

Date Revised: 9/22/2016

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050
Charting Our Course
Madison Area

15-Minute Transit Accessible Areas
Grocery Store



Areas accessible within a 15-minute bus ride from the points shown.

Saturday

- Full Service Grocery Store
- 15 Minute Travel Time

Notes:

Accessible areas are based on the shortest travel time from the points shown leaving between 11 am and 1 pm.

Walking distances are straight-line paths regardless of the pedestrian network and obstacles that may exist and cannot exceed 1/4 mile.

Travel times are based on Metro Transit bus schedules effective August 28, 2016, not including supplemental Sunday service.

Prepared by staff to the:
Madison Area
T • P • B
Transportation Planning Board

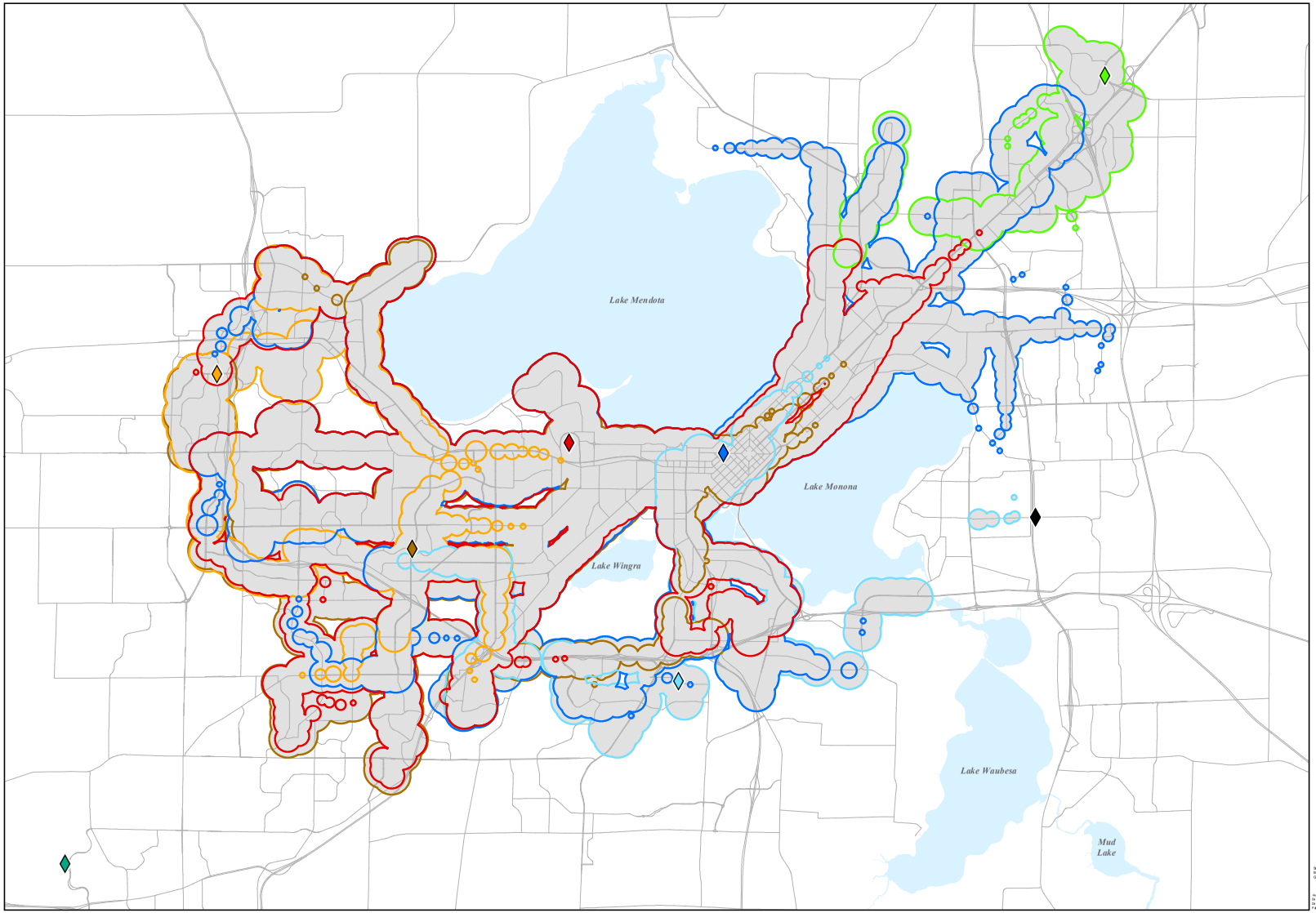
0 0.5 1 Miles

Date Revised: 9/22/2016

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050 Madison Area
Charting Our Course

45-Minute Transit Accessible Areas
Employment Centers



Areas accessible within a 45-minute bus ride from the points shown.

Weekday Mid Day

Trip Origins

- American Center
- Epic Sysyems
- Greenway Station
- Stewart Street
- UW Hospital
- UW Madison / Downtown
- UW Research Park I
- World Dairy Center
- 45 Minute Travel Time

Notes:

Accessible areas are based on the shortest travel time from the points shown leaving between 11 am and 1 pm.

Walking distances are straight-line paths regardless of the pedestrian network and obstacles that may exist and cannot exceed 1/4 mile.

Travel times are based on Metro Transit bus schedules effective August 28, 2016, not including supplemental Sunday service.

Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

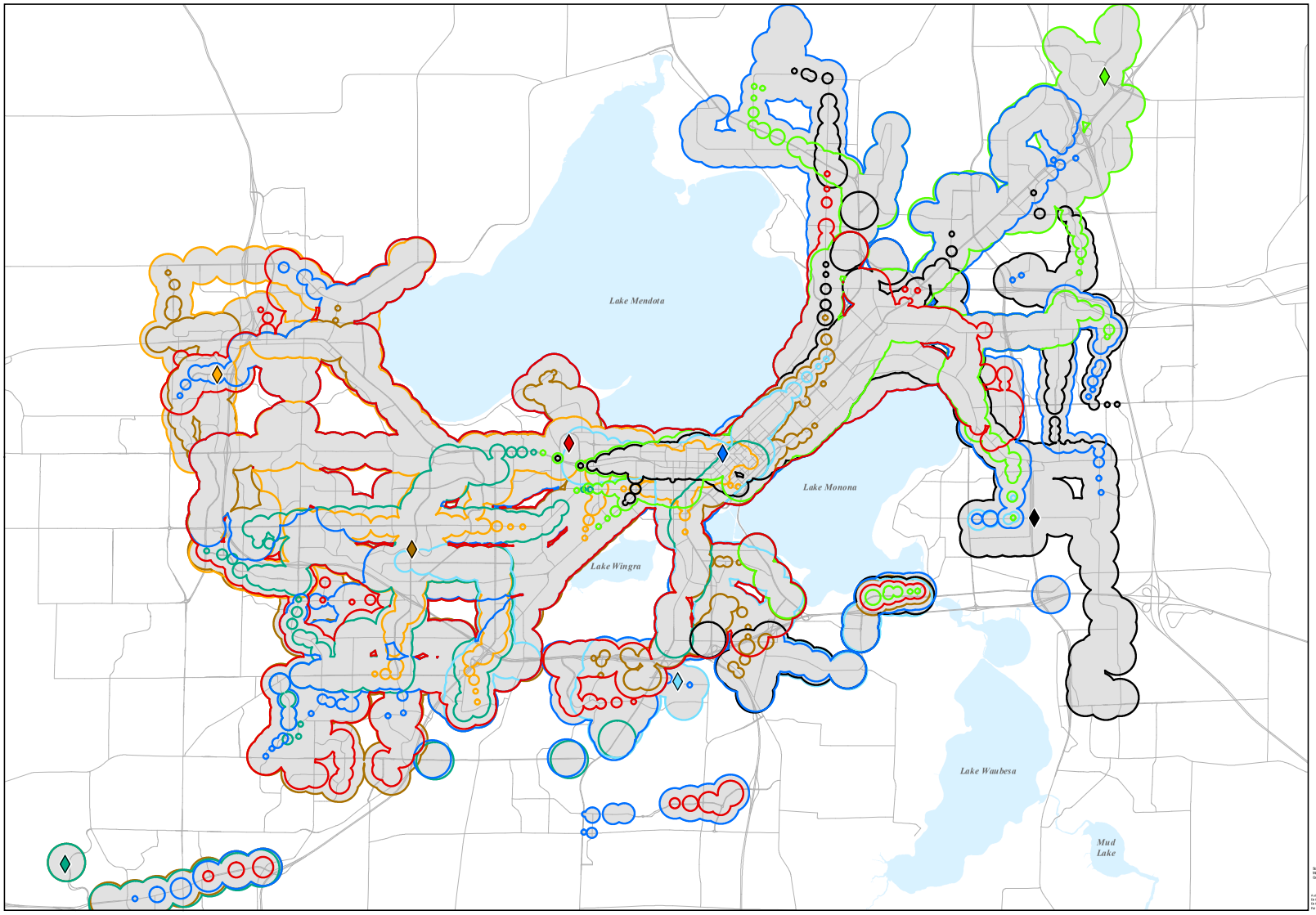
Miles

Date Revised: 9/2/2016

Lambert Conformal Conic Projection
WISCRS: Dane, NAD 83(91)

Regional Transportation Plan 2050 Madison Area
Charting Our Course

45-Minute Transit Accessible Areas
Employment Centers



Areas accessible within a 45-minute bus ride from the points shown.

Weekday PM

Trip Origins

- American Center
- Epic Sysyems
- Greenway Station
- Stewart Street
- UW Hospital
- UW Madison / Downtown
- UW Research Park I
- World Dairy Center

45 Minute Travel Time

Notes:

Accessible areas are based on the shortest travel time from the points shown leaving between 4 pm and 5:30 pm.

Walking distances are straight-line paths regardless of the pedestrian network and obstacles that may exist and cannot exceed 1/4 mile.

Travel times are based on Metro Transit bus schedules effective August 28, 2016, not including supplemental Sunday service.

Prepared by staff to the:
Madison Area T·P·B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

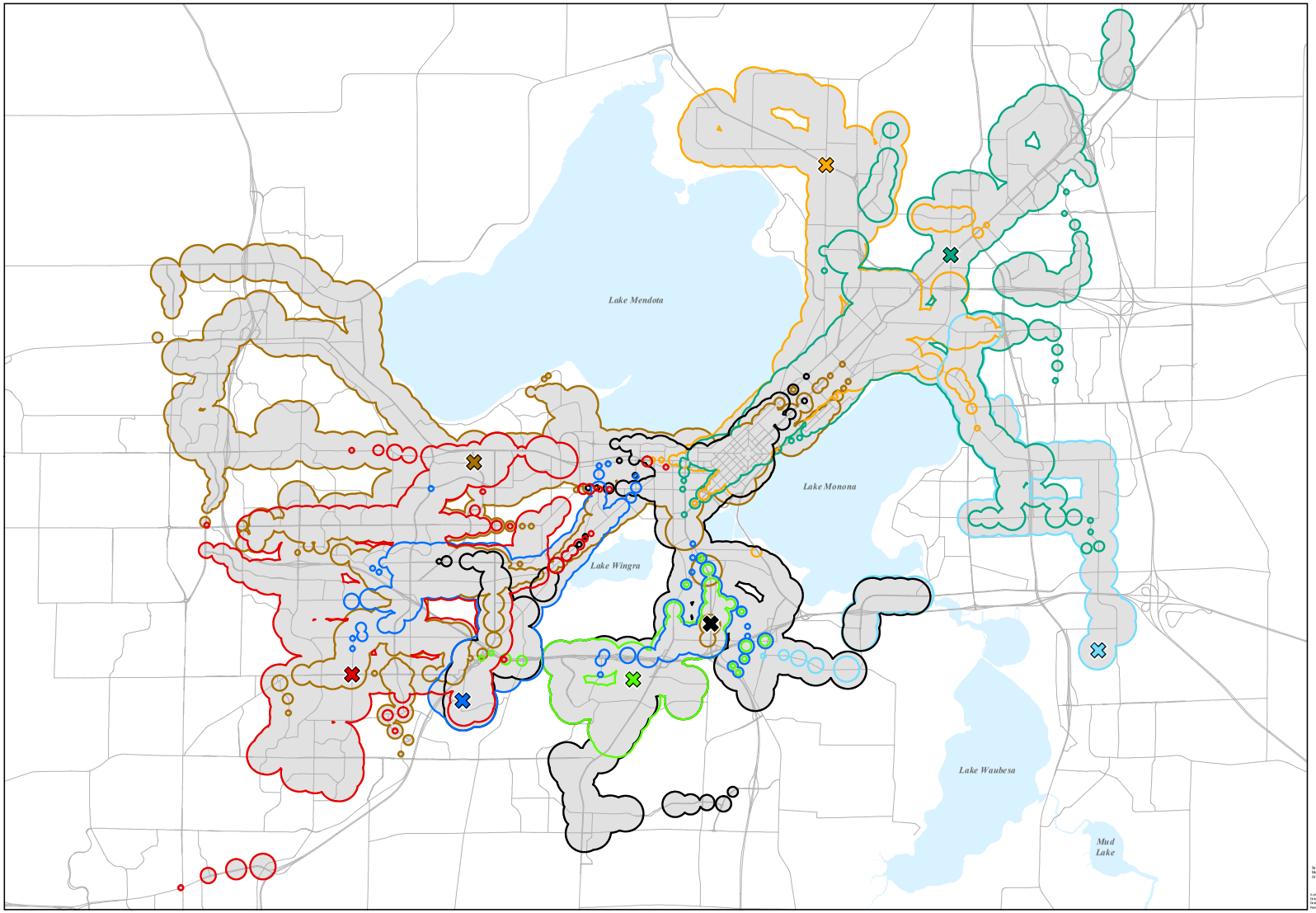
Miles

Date Revised: 9/22/2016

Lambert Conformal Conic Projection
WGS/RS: Done: NAD83(91)

Regional Transportation Plan 2050
Charting Our Course
Madison Area

30-Minute Transit Accessible Areas
Environmental Justice Areas



Areas accessible within a 30-minute bus ride from the points shown.

Weekday AM

Trip Origins

- Allied / Dunn's Marsh
- Coho Street
- Hill Farms
- North Sherman Avenue
- Owl Creek
- Raymond Road
- South Park Street
- Wright Street

30 Minute Travel Time

Notes:

Accessible areas are based on the shortest travel time from the points shown leaving between 7 am and 8:30 am.

Walking distances are straight-line paths regardless of the pedestrian network and obstacles that may exist and cannot exceed 1/4 mile.

Travel times are based on Metro Transit bus schedules effective August 28, 2016, not including supplemental Sunday service.

Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board

Miles

Date Revised: 9/2/2016

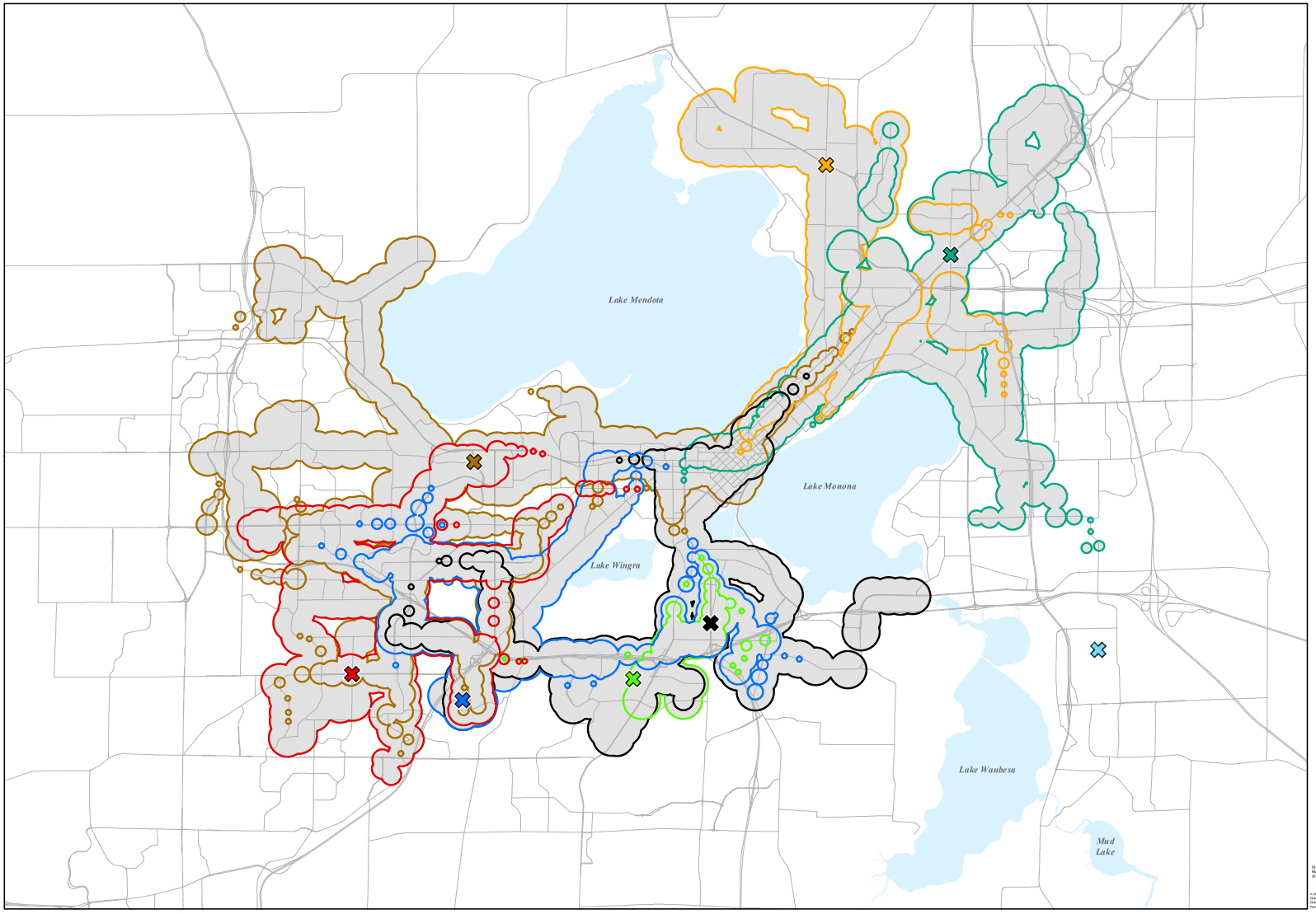
Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83 (91)

Regional Transportation Plan 2050 Madison Area

Charting Our Course

30-Minute Transit Accessible Areas

Environmental Justice Areas



Areas accessible within a 30-minute bus ride from the points shown.

Weekday Mid Day

Trip Origins

- Allied / Dunn's Marsh
- Coho Street
- Hill Farms
- North Sherman Avenue
- Owl Creek
- Raymond Road
- South Park Street
- Wright Street

30 Minute Travel Time

Notes:

Accessible areas are based on the shortest travel time from the points shown leaving between 11 am and 1 pm.

Walking distances are straight-line paths regardless of the pedestrian network and obstacles that may exist and cannot exceed 1/4 mile.

Travel times are based on Metro Transit bus schedules effective August 28, 2016, not including supplemental Sunday service.

Prepared by staff to the:

Madison Area T•P•B Transportation Planning Board

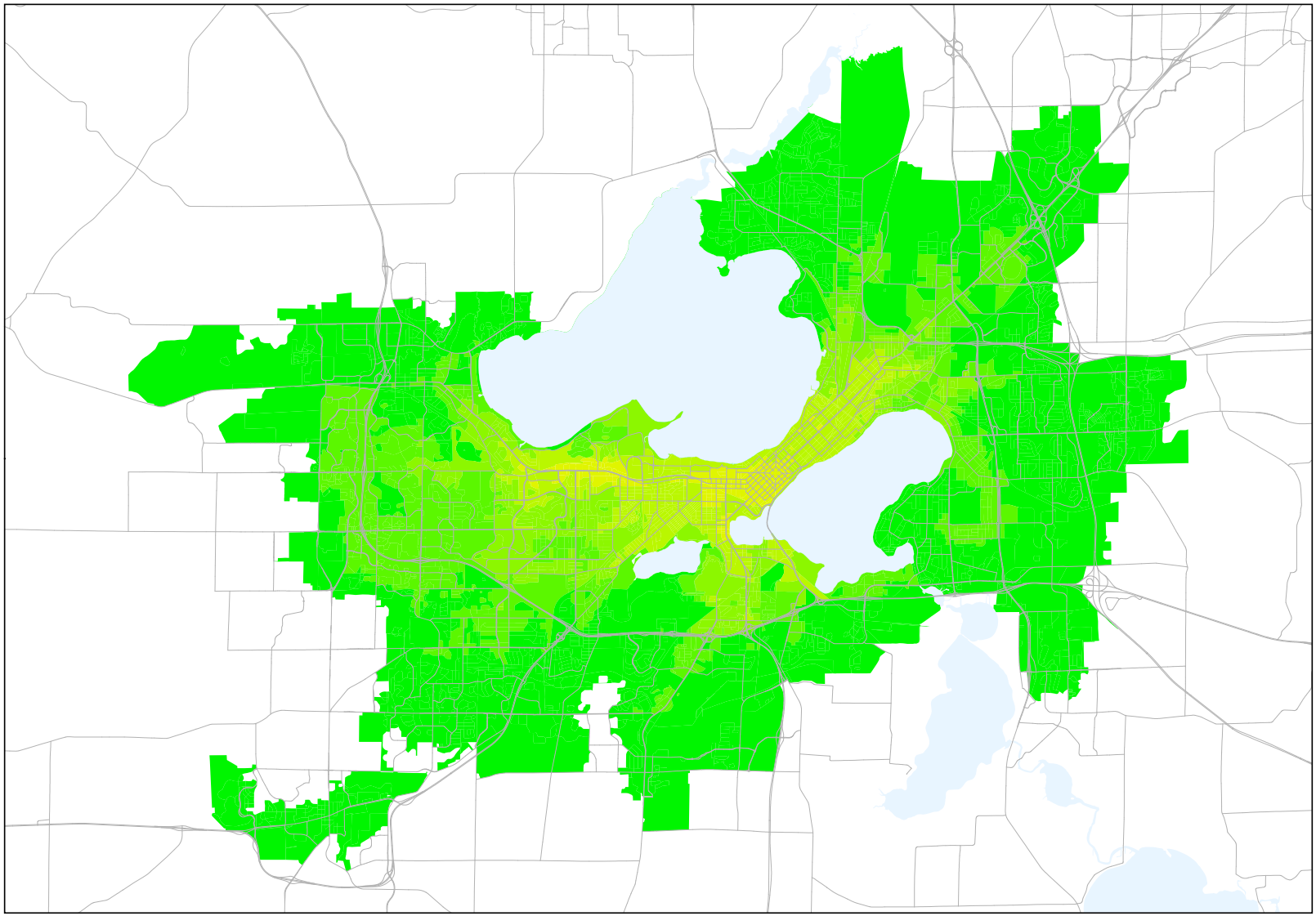
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Date Revised: 9/2/2016

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83 (91)

Regional Transportation Plan 2050 Madison Area
Charting Our Course

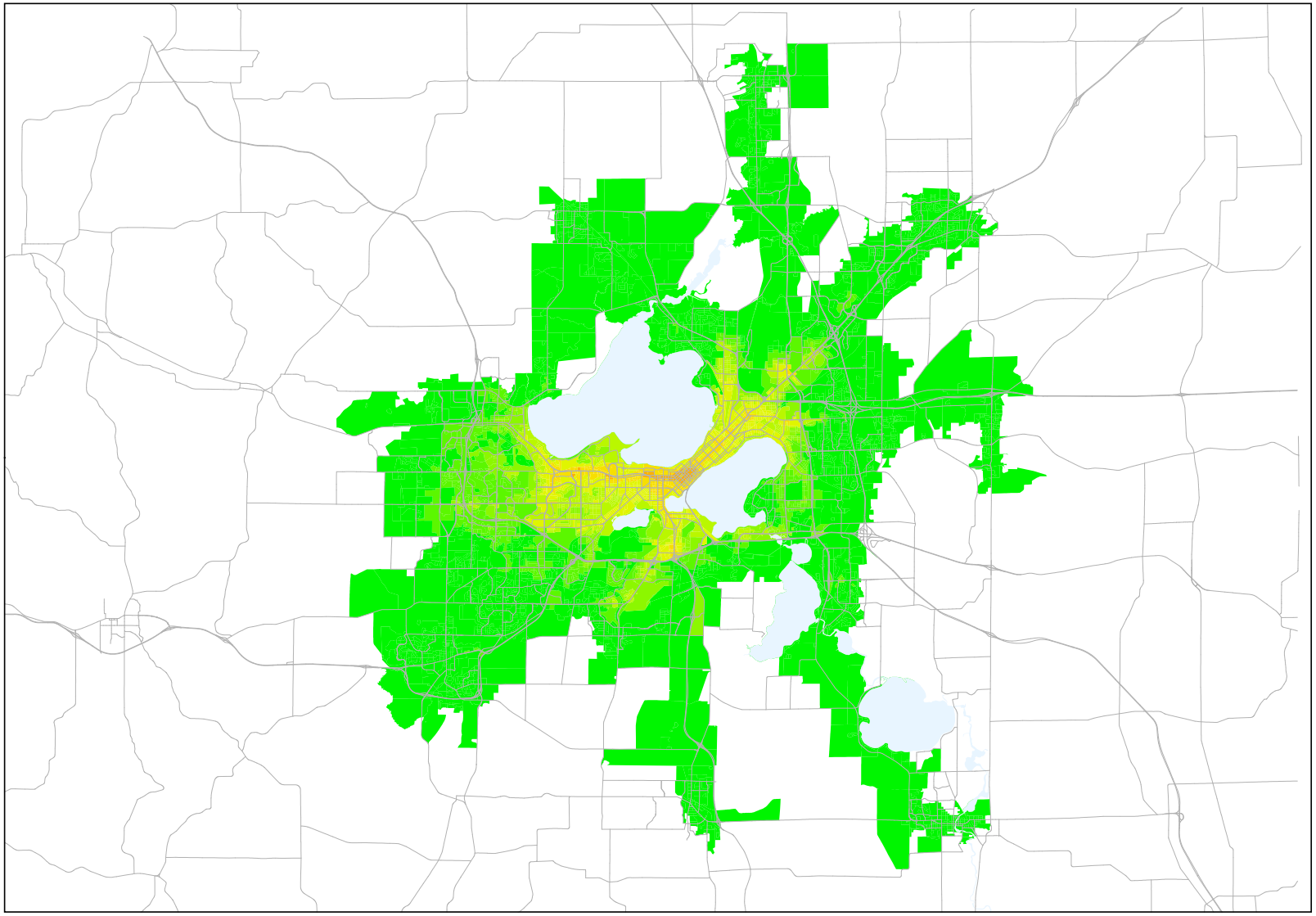
Jobs (2010) within 30 Minutes by Walking and Transit (3/2015) on Existing Network



Regional Transportation Plan 2050 Madison Area

Charting Our Course

Jobs (2010) within 30 Minutes by Walking and Transit on Future Network



Percent Total Jobs
In Madison Urban Area

- 0% - 6%
- 7% - 14%
- 15% - 23%
- 24% - 31%
- 32% - 38%
- 39% - 45%
- 46% - 49%

Prepared by staff to the:
Madison Area T·P·B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

Source Info:
Transit Access - Sugar Access calculation (MATPB);
Employment: 2010 (MATPB, InfoUSA);
Functional Classifications: 2014 (MATPB, WDOT)

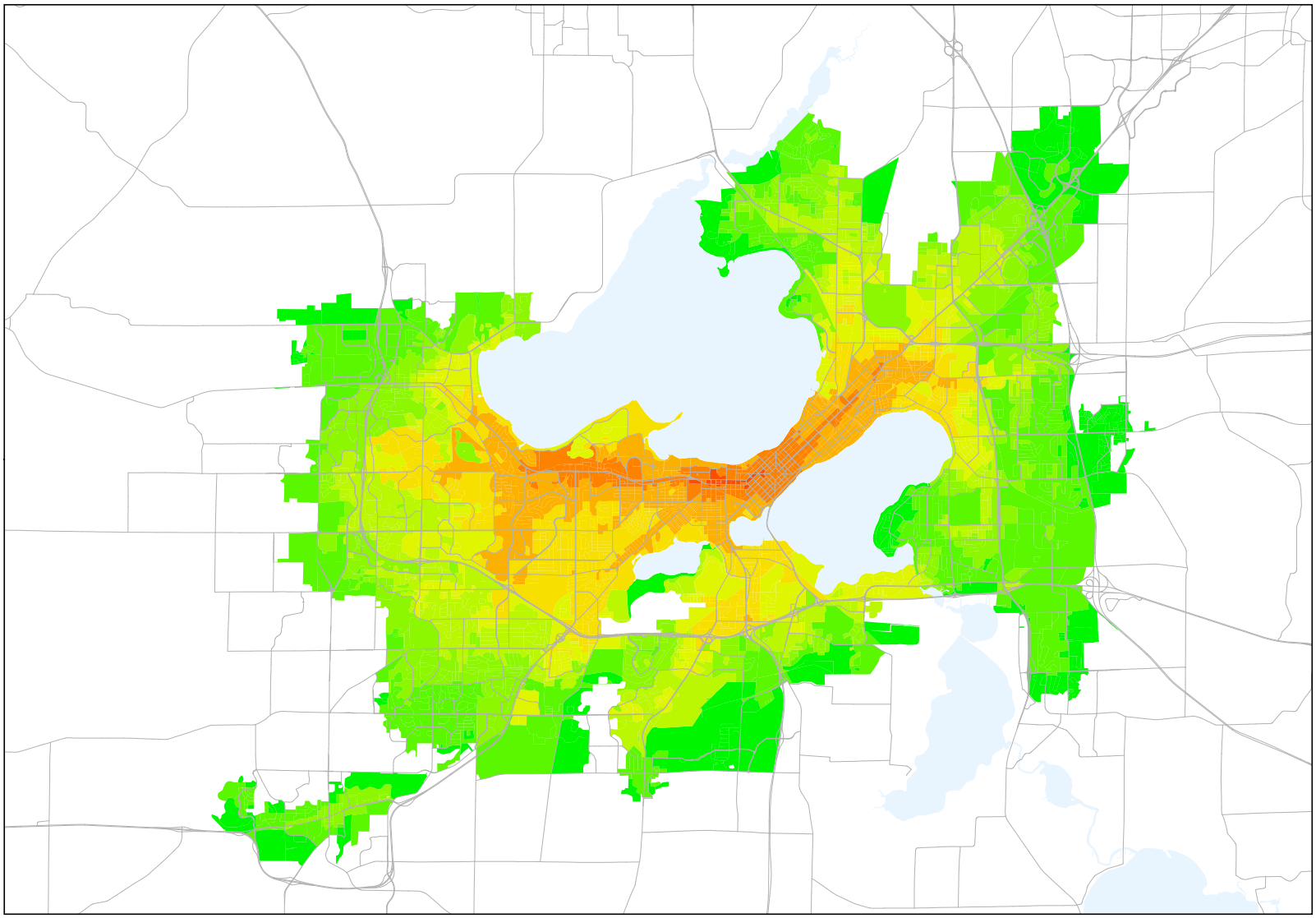
Author: jdag
Date Printed: 7/1/2016
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Date Revised: 7/8/2016

Lambert Conformal Conic Projection
WISCRS--Dane, NAD 83(91)

Regional Transportation Plan 2050 Madison Area
Charting Our Course

Jobs (2010) within 45 Minutes by Walking and Transit (3/2015) on Existing Network



Percentage of Jobs (2010) in Madison Urban Area Accessible within 45 Minutes of Walking and/or Transit During the Morning Peak Period

- 2% - 6%
- 7% - 14%
- 15% - 23%
- 24% - 31%
- 32% - 38%
- 39% - 45%
- 46% - 53%
- 54% - 62%
- 63% - 64%

Note: Areas in White are not served by Bus Transit.

Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

Source of Info:
Transit Access - Sugar Access calculation (MATPB);
Employment: 2010 (MATPB, WisDOA);
Functional Class Routions: 2014 (MATPB, WisDOT)

Author: ytang
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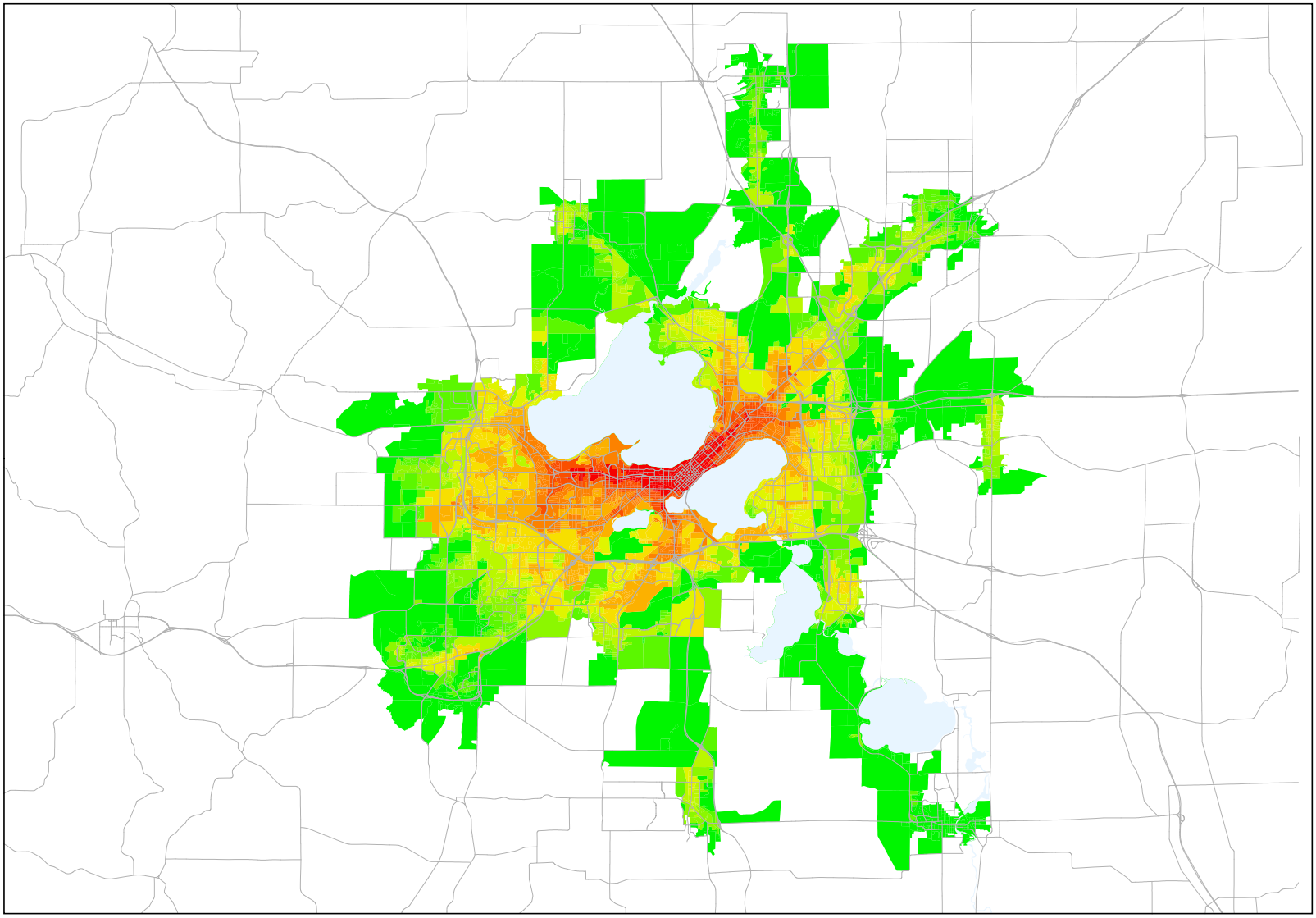
0 0.75 1.5 Miles

Date Revised: 9/9/2016

Lambert Conformal Conic Projection
WISCRS-Dane, NAD1983(91)

Regional Transportation Plan 2050
Charting Our Course
Madison Area

Jobs (2010) within 45 Minutes by Walking and Transit on Future Network



Percent Total Jobs
In Madison Urban Area

- 0% - 6%
- 7% - 14%
- 15% - 23%
- 24% - 31%
- 32% - 38%
- 39% - 45%
- 46% - 53%
- 54% - 62%
- 63% - 73%
- 74% - 87%

Prepared by staff to the:
Madison Area
T·P·B
Transportation Planning Board
A Metropolitan Planning Organization (MPO)

Source Info
Transit Access - Sugar Access calculation (MATPB).
Employment: 2010 (MATPB, WisDOA).
Functional Classifications: 2014 (MATPB, WisDOT).

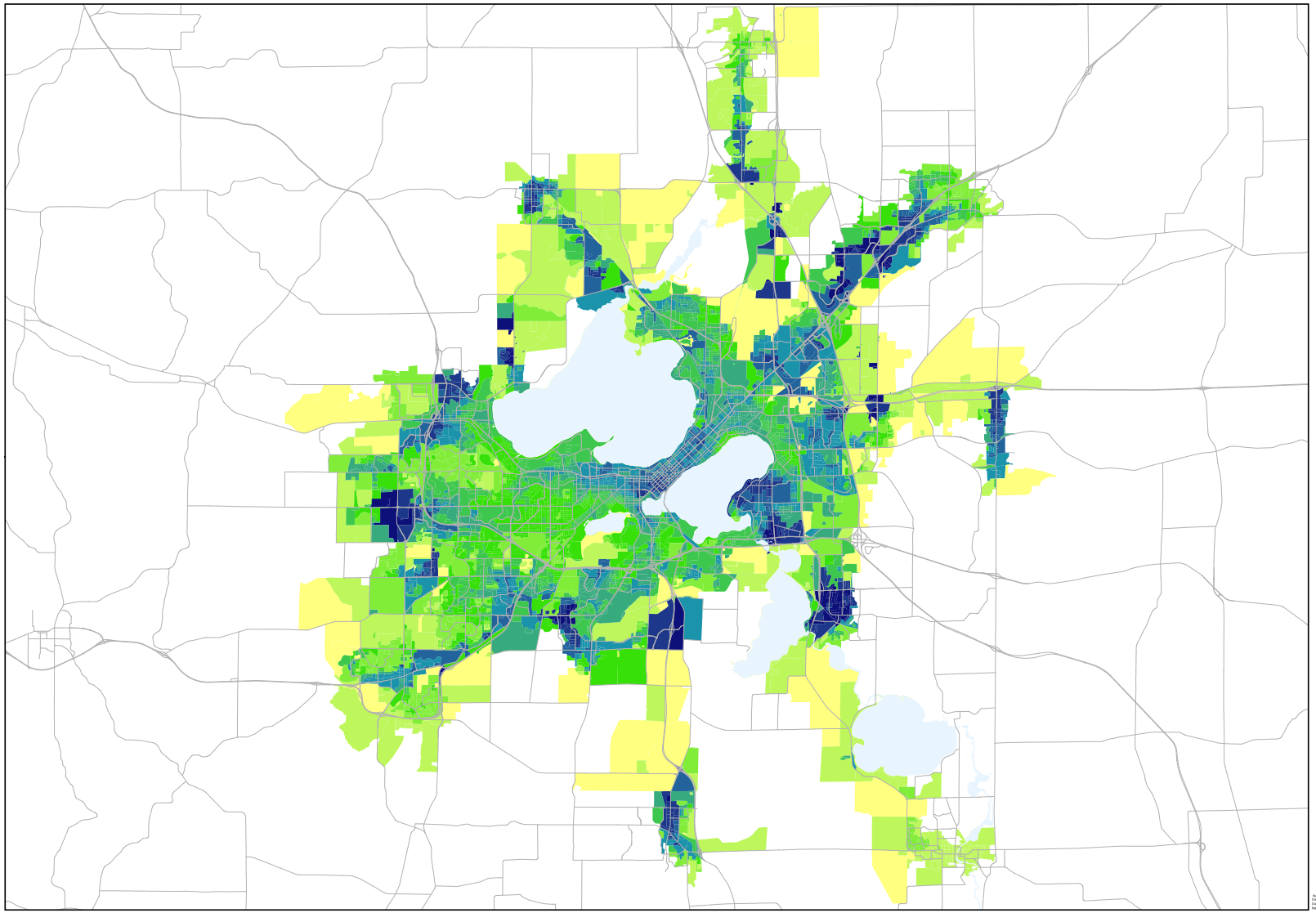
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Date Revised: 7/6/2016

Lambert Conformal Conic Projection
WISCRS--Dane, NAD 83(91)

Regional Transportation Plan 2050 Madison Area
Charting Our Course

Increase of Jobs (2010) within 45 Minutes by Walking and Transit on Future Network.



Percent Total Jobs
In Madison Urban Area

- 0%
- 1% - 3%
- 4% - 8%
- 9% - 12%
- 13% - 16%
- 17% - 19%
- 20% - 23%
- 24% - 28%
- 29% - 34%
- 35% - 51%

Prepared by staff to the:
Madison Area
T·P·B
Transportation Planning Board
(A Metropolitan Planning Organization (MPO))

Source Info:
Trans4Access - Sugar Access calculation (MPO).
Employment: 2010 (MPO, InfoUSA).
Functional Classifications: 2014 (MAPPS, WisDOT).

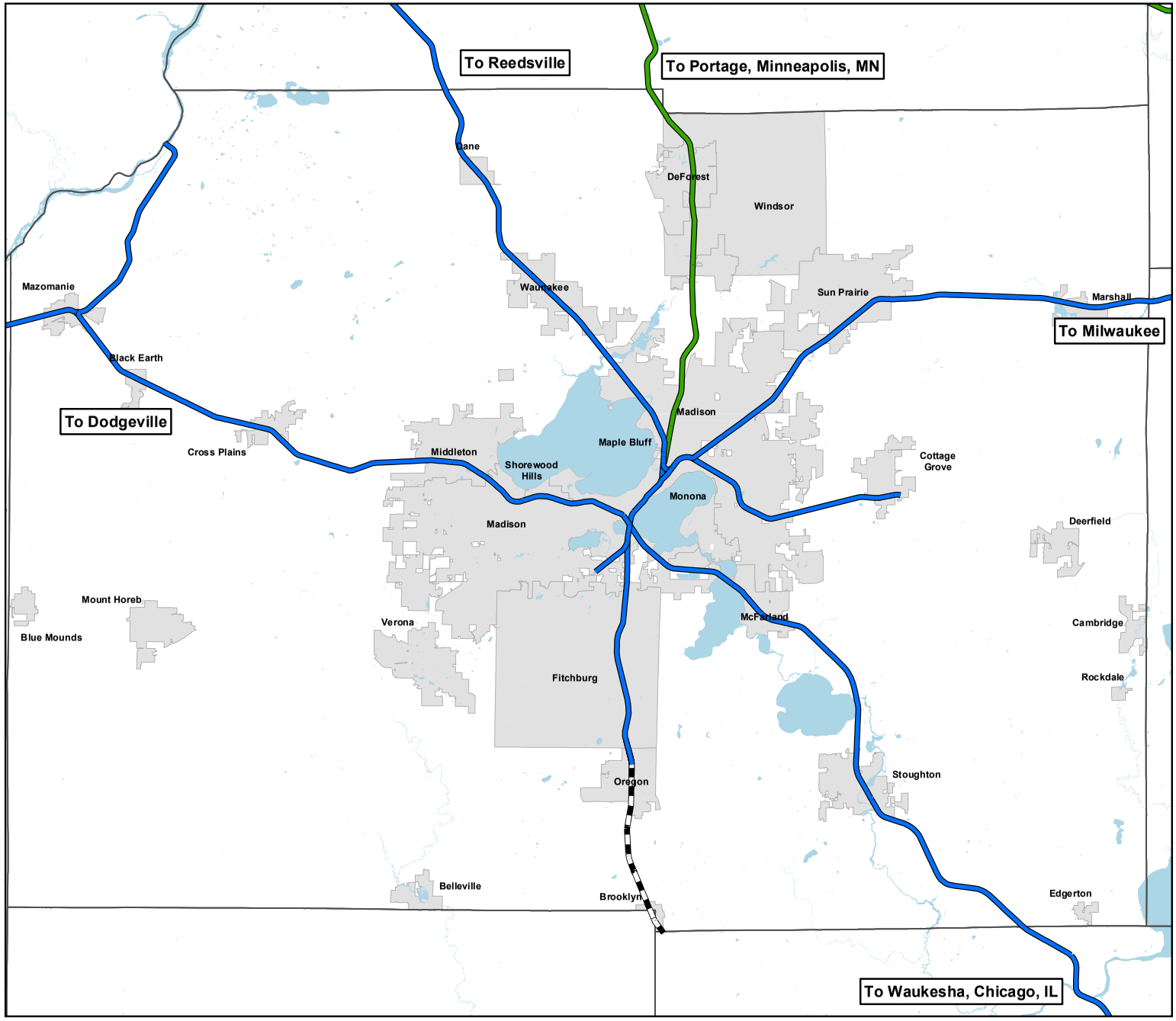
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Date Revised: 7/14/2016

Lambert Conformal Conic Projection
WISCRS- Dane, NAD1983(91)

Regional Transportation Plan 2050
Charting Our Course
Madison Area

Rail Network



Canadian Pacific Railway
Wisconsin and Southern Railroad
Inactive Railroad

Prepared by staff to the:
Madison Area T • P • B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

Source Info:
Civil Division Limits - DCLIO
Rail Lines - US DOT
Hydrography - Wisconsin DNR

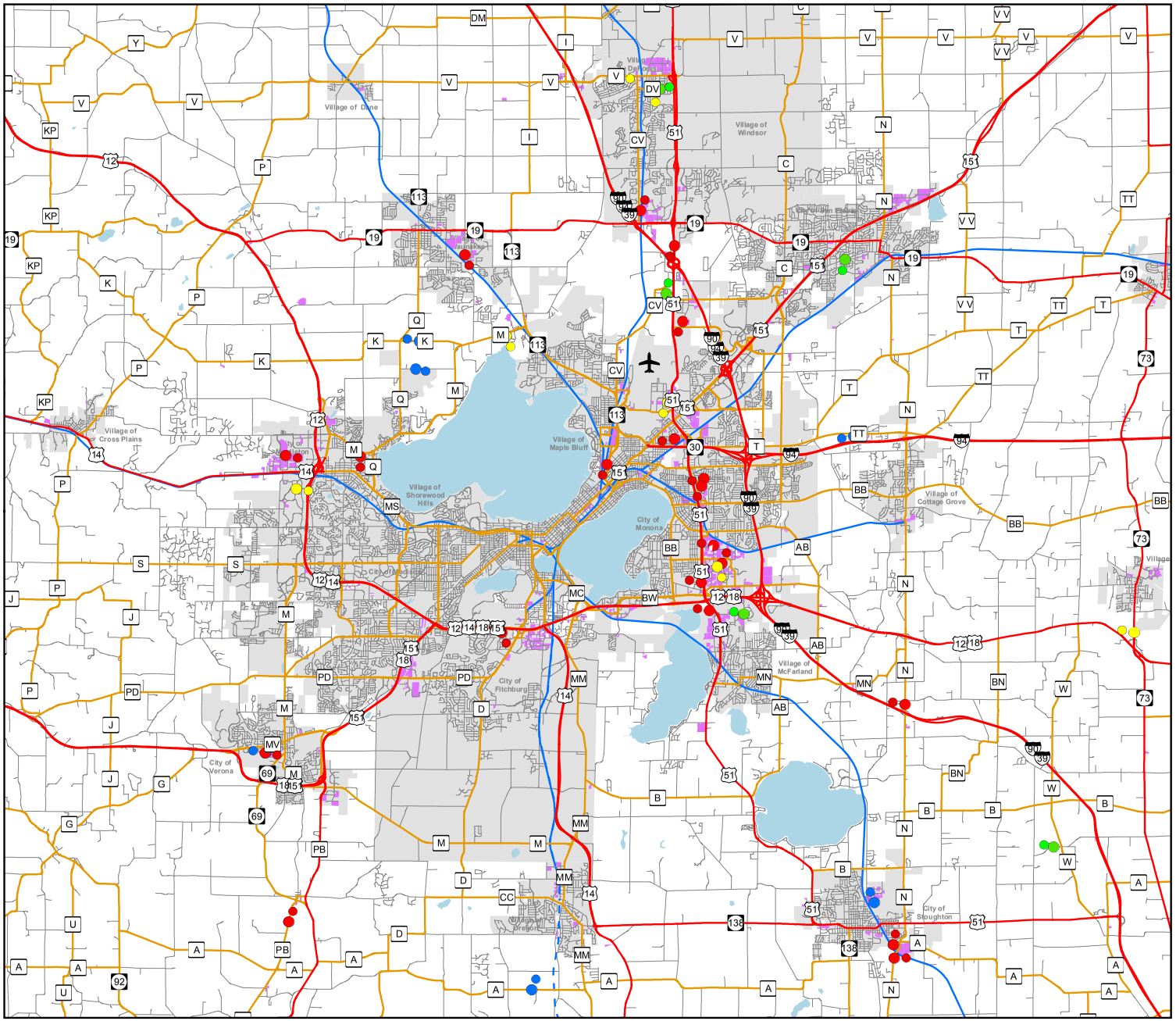
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Date Revised: 12/5/2016

Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

Regional Transportation Plan 2050
Madison Area
Charting Our Course

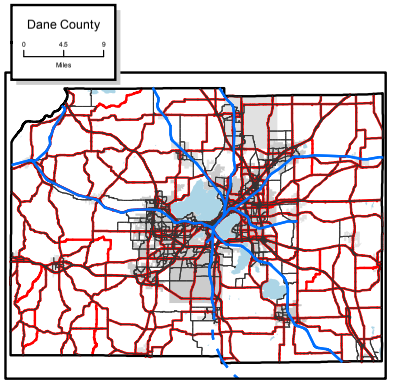
Freight Facilities and Service



Trucking Companies

- Contract Haulers
- Heavy Hauling
- Motor Freight
- Transportation Brokers
- Airports
- Regional Long Truck Route*
- Local Truck Route**
- Railroad Lines
- Local Rail Bank
- Industrial

* Designated by WisDOT
** Compilation of Routes Designated by Dane County and City of Madison



Prepared by staff to the:
Madison Area
T • P • B
Transportation Planning Board
A Metropolitan Planning Organization (MPO)

Source Info:
Bicycle Paths and Routes: 2014 (MATPB).
Street Base: 2013, Orthophoto Derived (DCLIO).
Functional Classifications: 2014 (MATPB, WDOT).
Hydrography: 1200, 1:24,000 (WDNR).
Civil Division Limits: 2014, Annexation Records (DCLIO).

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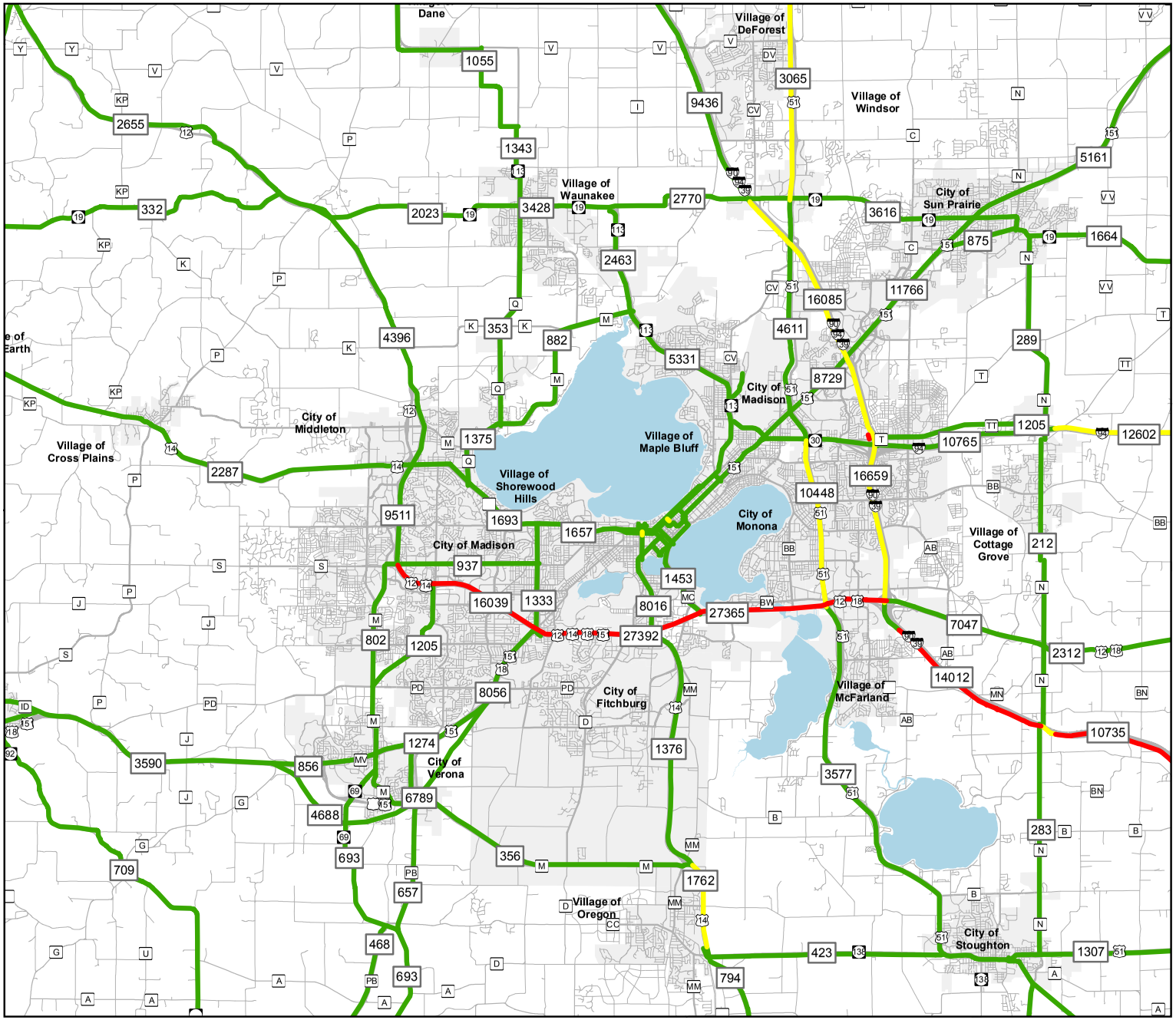
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Miles

Date Revised: 12/6/2016

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050
Charting Our Course
Madison Area

Freight Traffic Congestion, 2007



Freight Volume to Roadway Capacity Ratio

- < 0.75 (Not Congested)
- 0.75 - 0.95 (Some Congestion)
- >0.95 (Congested)

xx — Average Annual Daily Truck Volumes

FHWA's Freight Analysis Framework estimates commodity movements over specific highways. Freight route congestion is shown as a ratio of truck volume to roadway capacity. A ratio of 0.75 or less means that the roadway experiences few to no capacity issues throughout the year. Ratios of 0.75 - 0.95 indicate that the road may become congested intermittently. Ratios greater than 0.95 indicate that the road has significant recurring freight congestion.

Prepared by staff to the:
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A Metropolitan Planning Organization (MPO)

Source Info:
DCLIO, WisDOT, MATPB

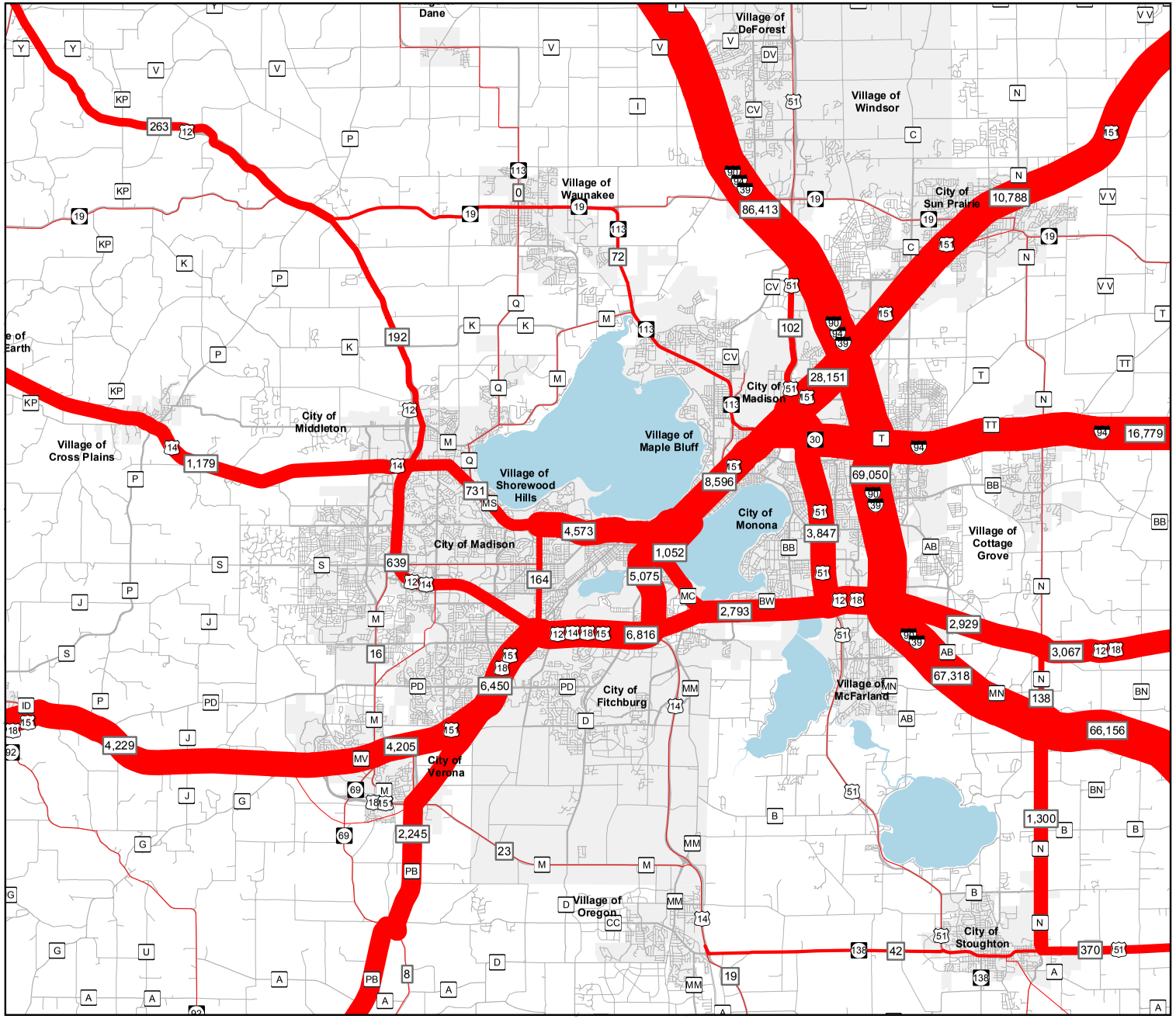
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0 1.25 2.5
Miles
Date Revised: 12/1/2016

Lambert Conformal Conic Projection
WISCRS-Dane, NAD 83(91)

Regional Transportation Plan 2050 Madison Area
Charting Our Course

Annual Truck Freight Tonnages (2007)



XX Kilotons of Freight Annually

FHWA's Freight Analysis Framework estimates commodity movements over specific highways. In Dane County, Regional truck freight routes have been illuminated in red. Thicker lines indicate higher freight tonnages. Tonnages are measured in kilotons. One kiloton is equal to one billion pounds of freight.

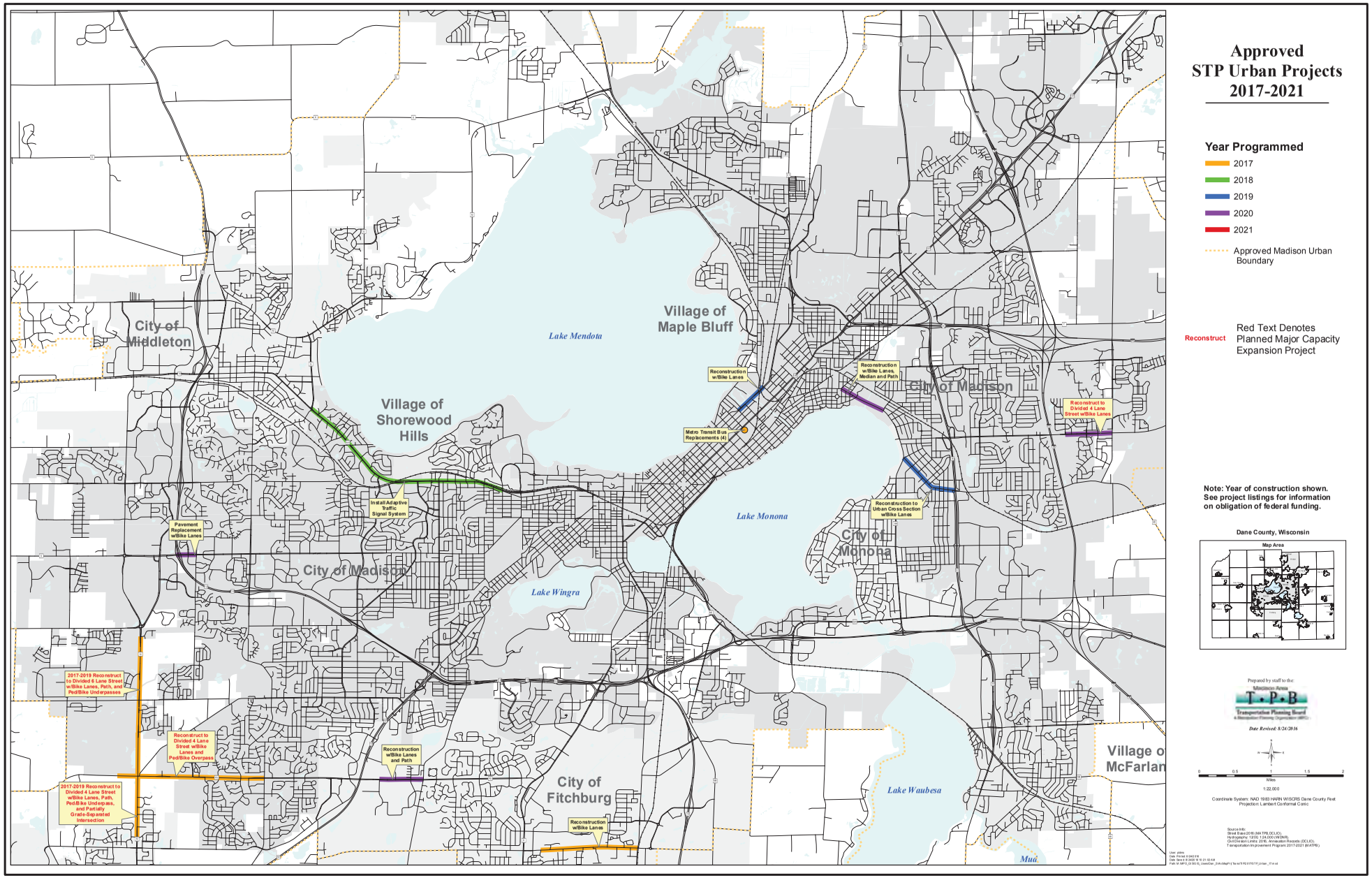
Prepared by staff to the:
Madison Area Transportation Planning Board
A Metropolitan Planning Organization (MPO)

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0 1.25 2.5
Miles

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)



Approved STP Urban Projects 2017-2021

Year Programmed

- 2017
- 2018
- 2019
- 2020
- 2021
- Approved Madison Urban Boundary

Reconstruct — Red Text Denotes Planned Major Capacity Expansion Project

Note: Year of construction shown. See project listings for information on obligation of federal funding.

Dane County, Wisconsin

Map Area

Prepared by staff to the Madison Area Transportation Planning Board

Date Revised: 8/24/2016

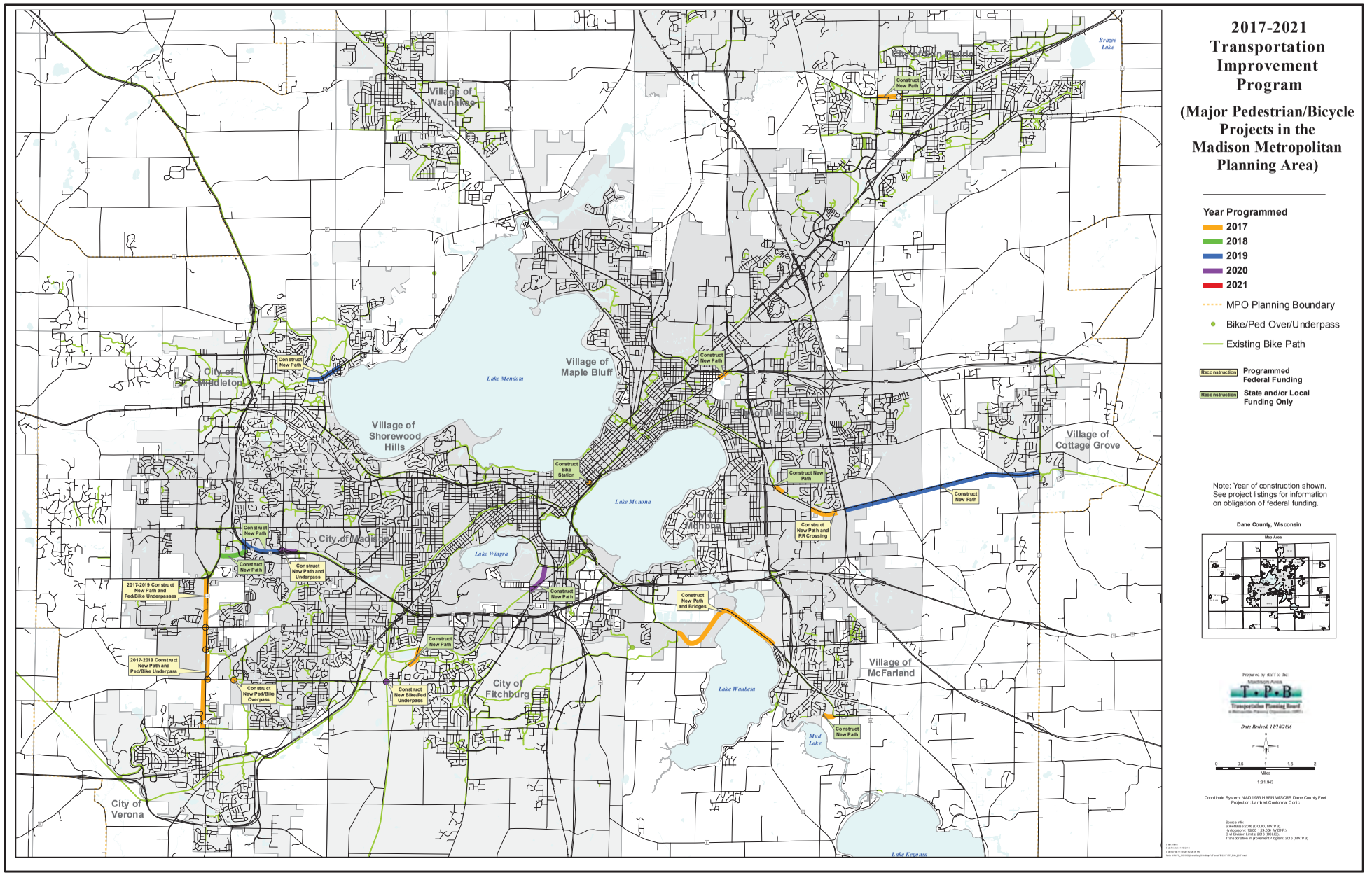
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1:22,000

Coordinate System: NAD 1983 HARN WISCRS Dane County Feet Projection: Lambert Conformal Conic

Source Info:
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Hydrology 1:250, 1:24,000 (WDNR),
Civil Division Limits 2016, Annexation Records (DCLIC),
Transportation Improvement Program 2017-2021 (MATPB)

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2017-2021 Transportation Improvement Program

(Major Pedestrian/Bicycle Projects in the Madison Metropolitan Planning Area)

Year Programmed

- 2017
- 2018
- 2019
- 2020
- 2021
- MPO Planning Boundary
- Bike/Ped Over/Underpass
- Existing Bike Path

Reconstruction — Programmed Federal Funding

Reconstruction — State and/or Local Funding Only

Note: Year of construction shown. See project listings for information on obligation of federal funding.

Dane County, Wisconsin

Map Area

Prepared by staff to the Madison Area Transportation Planning Board

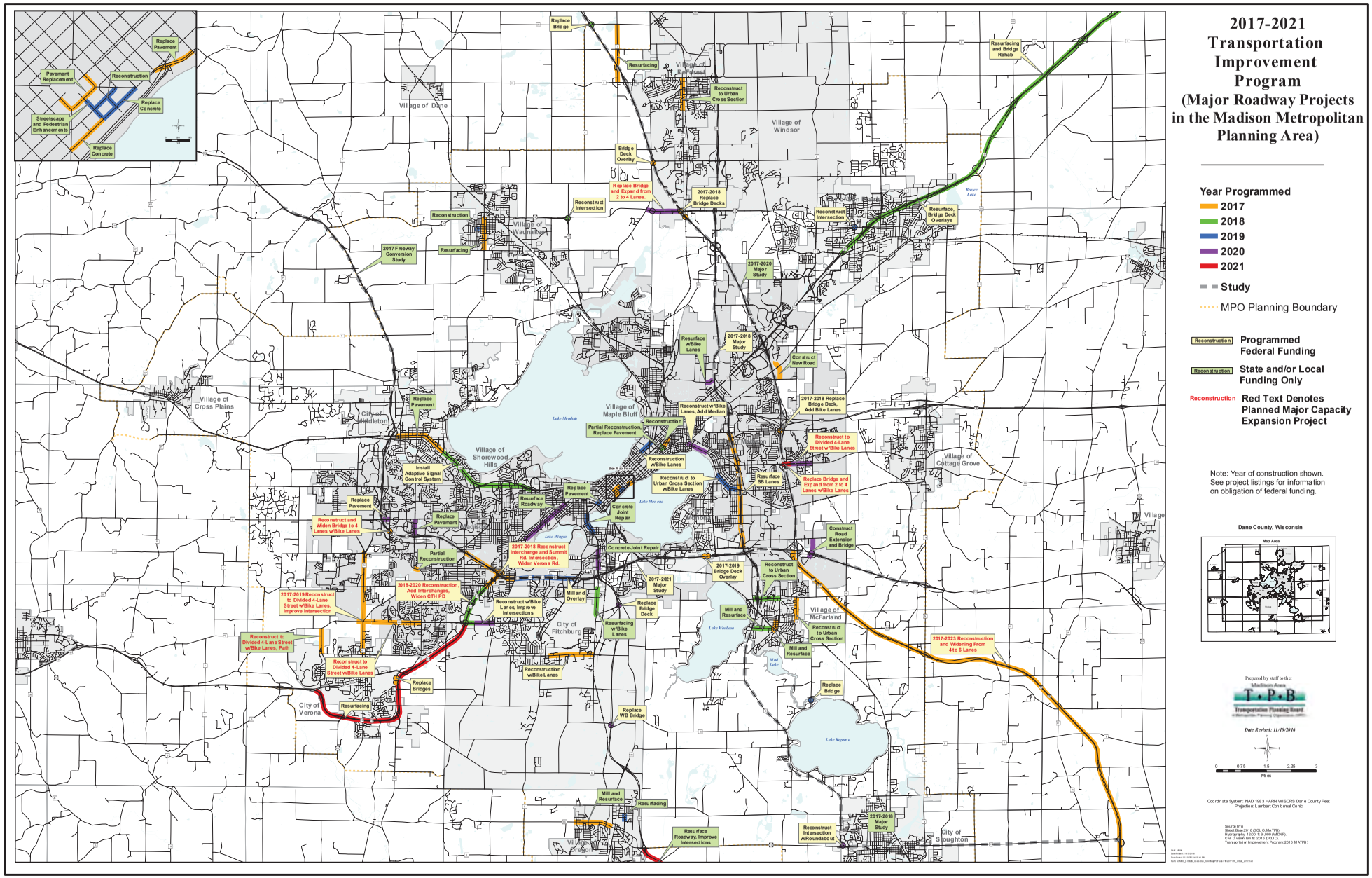
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Coordinate System: NAD 1983 HARN WISCRS Dane County Feet
Projection: Lambert Conformal Conic

Source Info:
Streets/Roads 2016 (DCLIO, MATPB);
Hydrography: 12/00; 1:24,000 (WDNR);
Civil Division Limits: 2016 (DCLIO);
Transportation Improvement Programs: 2016 (MATPB)



2017-2021 Transportation Improvement Program (Major Roadway Projects in the Madison Metropolitan Planning Area)

Year Programmed

- 2017
- 2018
- 2019
- 2020
- 2021
- Study
- MPO Planning Boundary

Reconstruction — Programmed Federal Funding

Reconstruction — State and/or Local Funding Only

Reconstruction — Red Text Denotes Planned Major Capacity Expansion Project

Note: Year of construction shown. See project listings for information on obligation of federal funding.

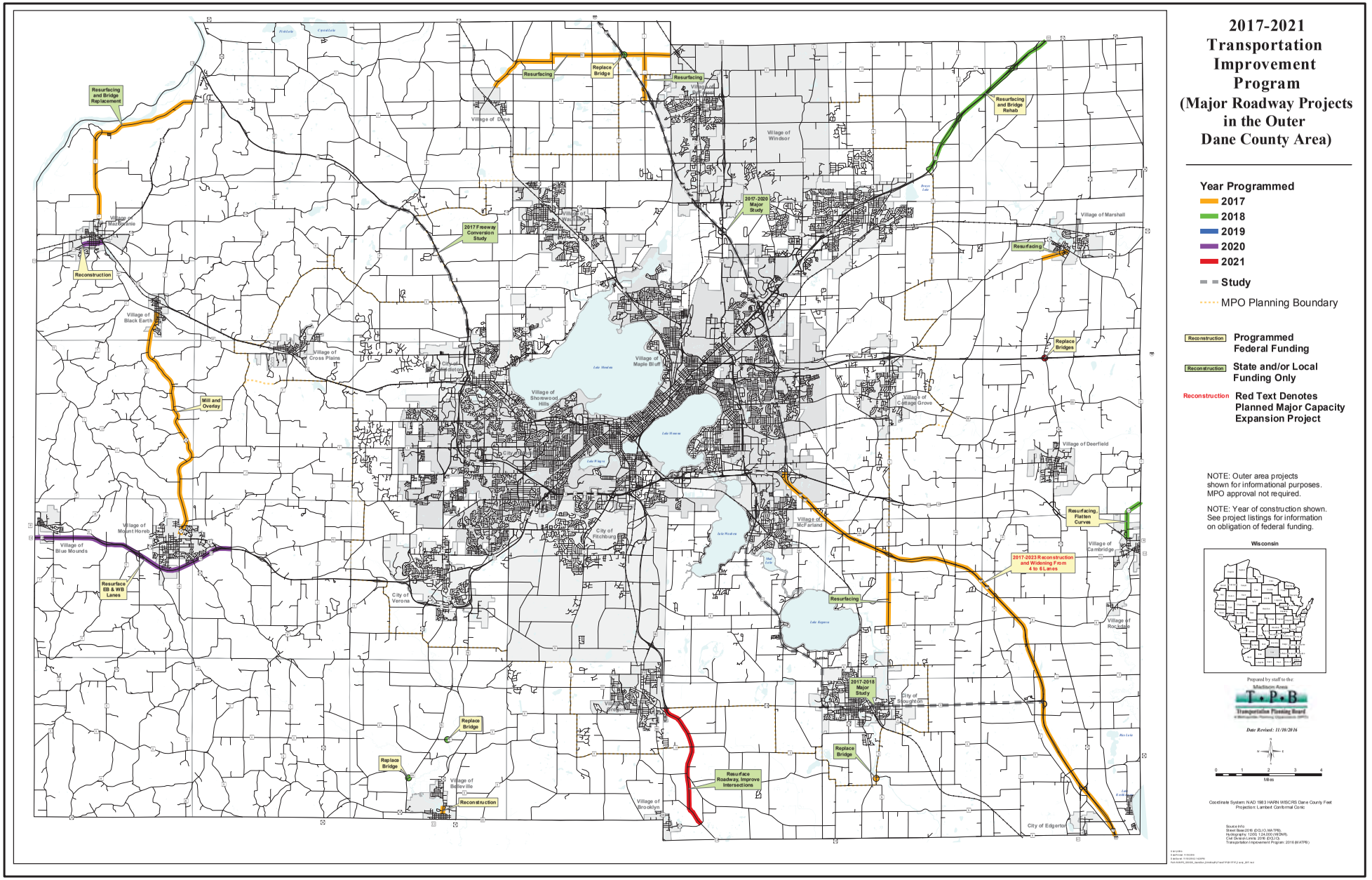
Dane County, Wisconsin

Prepared by staff to the:
Madison Area Transportation Planning Board

Date Revised: 11/10/2016

Coordinate System: NAD 1983 HARN WISCRS Dane County Feet
Projection: Lambert Conformal Conic

Source Info
Street Base:2016 (DCLIO, MATPB)
Civil Division Lines: 2010 (USCB/DNR);
Civil Division Labels: 2016 (DCLIO);
Transportation Improvement Program: 2016 (MATPB)



2017-2021 Transportation Improvement Program (Major Roadway Projects in the Outer Dane County Area)

Year Programmed

- 2017
- 2018
- 2019
- 2020
- 2021
- Study
- MPO Planning Boundary

Reconstruction — **Programmed Federal Funding**

Reconstruction — **State and/or Local Funding Only**

Reconstruction — **Red Text Denotes Planned Major Capacity Expansion Project**

NOTE: Outer area projects shown for informational purposes. MPO approval not required.

NOTE: Year of construction shown. See project listings for information on obligation of federal funding.

Wisconsin

Prepared by staff to the:

Madison Area Transportation Planning Board

Date Revised: 11/10/2016

0 1 2 3 4 Miles

Coordinate System: NAD 1983 HARN WISCRS Dane County Feet
Projection: Lambert Conformal Conic

Source Info:
Street Base:2016 (DOT/DC/MATPB);
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Civil Division Limits: 2016 (DOT/DC);
Transportation Improvement Program: 2016 (MATPB)

APPENDIX E: MPO COMPOSITION AND HISTORY

Introduction



As the designated Metropolitan Planning Organization (MPO), the Madison Area Transportation Planning Board (MATPB) is the policy body responsible for cooperative, comprehensive regional transportation planning and decision making for the Madison Metropolitan Planning Area as designated by the Governor of the State of Wisconsin under federal law and regulations. MPOs are required by federal law and regulations in all urban areas of 50,000 or more in population as a condition of spending federal highway and transit funds. The goal of the MPO planning process is to build regional agreement on transportation investments that balance roadway, public transit, bicycle, pedestrian, and other transportation needs and support the region's land use, economic, and environmental goals and plans.

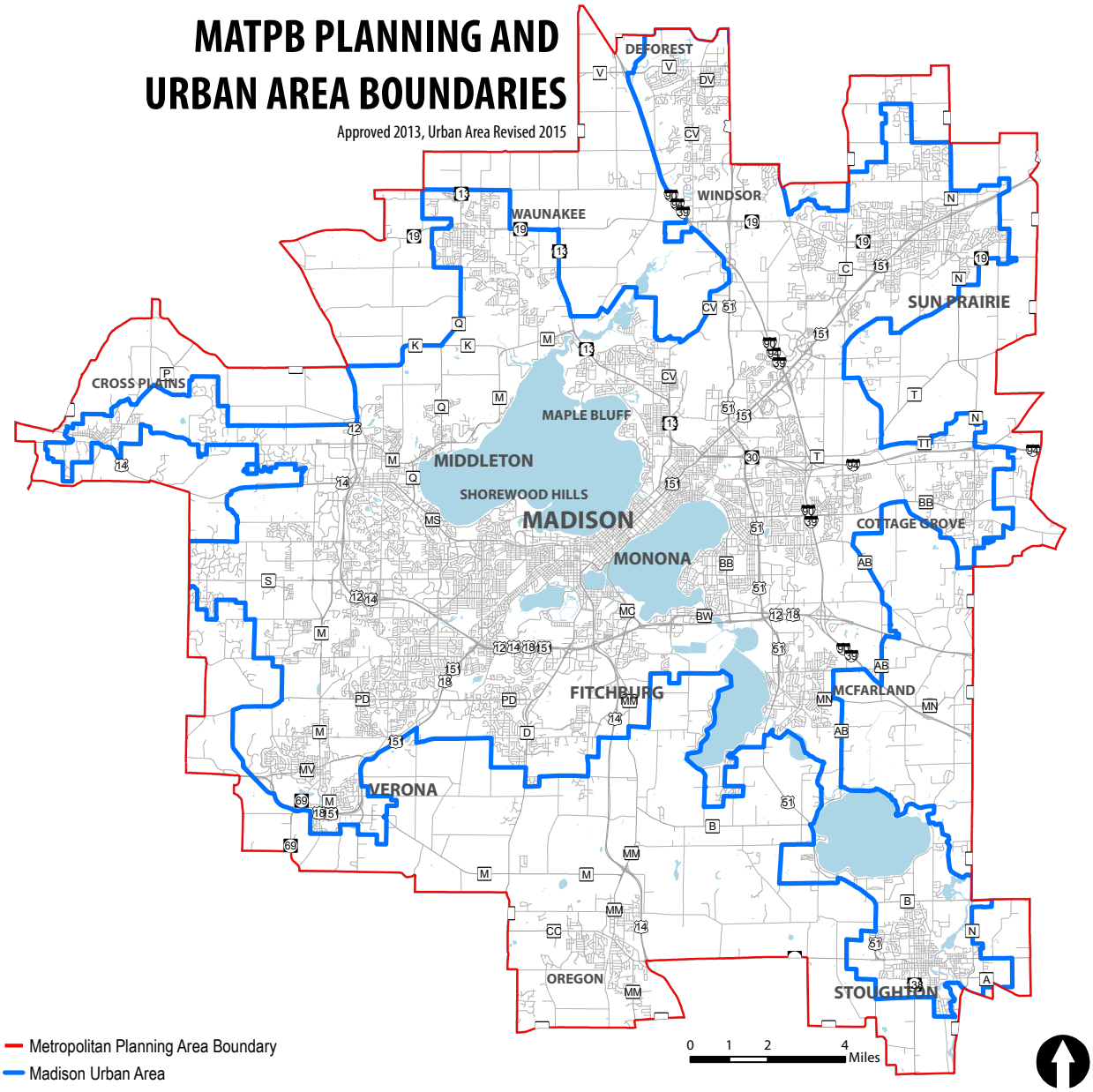
MATPB was created through an agreement between the Governor, City of Madison, and other municipalities in the Madison Urban Area making up over 80% of the population. The agreement, which became effective May 2, 2007, redesignated the MPO for the Madison Urban Area. MATPB assumed the responsibility to conduct transportation planning and programming for the Madison Metropolitan Area from the previous MPO, the Madison Area MPO, following the MPO's reorganization that restructured the MPO Policy Board. MPOs have served the Madison area since 1973.

Madison Metropolitan Planning Area

The Madison Metropolitan Planning Area consists of the City of Madison and the Madison Urban Area, including all or portions of 34 cities, villages, and towns that are likely to become urbanized within the next 25-year planning period. In addition to areas likely to become urbanized, the planning boundary also includes other areas that are important from a transportation perspective such as corridors where potential roadway improvements are located that may have significant impacts on regional travel patterns. The planning area covers approximately 416 square miles (excluding the lakes). The 2000 Census population within the planning area was 350,247, 82% of the countywide total of 426,526. The 2010 Census population for this same area was 401,810, 82% of the countywide total of 488,073.



Within the Madison Metropolitan Planning Area lies the Madison Urban Area. The urban area is based on the urbanized area defined by the U.S. Census



Bureau based primarily on population density. Following the delineation of the urbanized areas after each decennial Census, MPOs, in cooperation with State and local officials, make any needed adjustments to the urbanized area (e.g., to maintain continuity of peripheral transportation routes) and set new planning area boundaries. The new urban area and planning area boundaries must then be approved by the State and the Federal Highway Administration. The Madison Metropolitan Planning Area Boundaries were last updated and federally approved in 2013 and the Madison Urban Area Boundaries were last updated and federally approved in 2013 with a revision approved in 2015.

While the application of the federal metropolitan planning and programming requirements only applies to the Metropolitan Planning Area, the MPO accounts for commuting patterns in a larger multi-county region.

Governance Structure

MATPB is governed by a 14-member Policy Board appointed by the local units of government within the Metropolitan Planning Area, Dane County, Metro Transit, and the Wisconsin Department of Transportation (WisDOT). The City of Madison Mayor

appoints six members, the Dane County Executive appoints three members, the mayors and presidents of the other cities and villages appoint 3 members, one member is appointed by the towns, and the WisDOT Secretary appoints one member. One of the Madison Mayor's appointments must be a representative of Metro Transit, who can be the General Manager or a member of the city's Transit and Parking Commission. Two-thirds of the local and county appointments must be elected officials. Any non-elected persons must be "officials of public agencies that administer or operate major modes of transportation" in the metro area (e.g., transit manager, member of local land use or transportation commission).

Responsibilities

As the MPO for the Madison Metropolitan Area, MATPB is charged with carrying out a cooperative, continuous, and comprehensive (3C) planning process for setting transportation policy and making transportation investment decisions. To maintain the federally-certified planning process required by U.S. DOT in order to receive federal transportation funding, the MPO must at a minimum produce and maintain three major products:

1. Long-Range Regional Transportation Plan (RTP)

   The RTP provides a 20-year perspective of existing and projected transportation system capabilities, needs, and associated objectives, as well as recommended policies and actions to meet these objectives. The RTP serves as a framework for guiding federally-funded transportation planning and investment decision making. It must be updated every five years.

2. Unified Planning Work Program (UPWP)

   This document programs federally-funded transportation planning activities to further develop the policies and actions contained in the RTP into concept-level projects and programs. The UPWP allocates funding for both specific planning projects (e.g., corridor studies, strategic plans for public transportation, etc.) and ongoing programmatic activities (e.g., travel demand modeling, transportation planning assistance, etc.). The UPWP is updated annually.

3. Transportation Improvement Program (TIP)

   The TIP identifies and schedules specific transportation improvements and programs that will receive federal transportation funding over the next four years. Projects included in the TIP are based on the RTP and typically emerge from recommendations identified in studies and programs in the UPWP and infrastructure needs identified by member agencies. The TIP must be four years and be updated every two years. MATPB prepares a 5-year TIP (with the last year informational) and updates it annually.

   In addition to completing these three major products, MATPB also undertakes various other USDOT-mandated activities and programs. Examples include development and implementation of a Public Participation Plan and a Congestion Management Process (CMP). MATPB also provides assistance to local units of government in areas such as travel demand forecasting and bicycle and pedestrian planning.

   All MPO activities are responsive to mandates and guidelines including, but not limited to, the Americans with Disabilities Act, Title VI of the Civil Rights Act of 1964, and environmental justice considerations.

   The framework established in this RTP, the selection of planning activities carried out through the UPWP, the investment decisions programmed in the TIP, and all other activities and programs conducted by the MPO are wholly consistent with the MPO's goals and objectives. These goals and objectives reflect local and regional objectives within the context of the ten major transportation planning factors established by the federal Fixing America's Surface Transportation Act (FAST Act).

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APPENDIX F: PEDESTRIAN FACILITIES TOOLBOX

Introduction



Appropriate pedestrian facilities and safety treatments ensure that urban streets provide adequate comfort and accessibility for all users. The type of facility and/or treatment that may be constructed in a specific area depends on a number of factors, including roadway configuration, vehicular traffic levels, available right of way, existing safety concerns, and project budget.

Pedestrian facilities are now typically built along new roadways within the region. In the past, however, many roads were constructed without pedestrian facilities. The Pedestrian Facilities Toolbox can be used when attempting to retrofit facilities on corridors lacking facilities or in areas with safely concerns as well as when constructing new roadways. The Pedestrian Facilities Toolbox describes the different types of pedestrian facilities, articulates their benefits, and describes generally when to use the facilities. The Toolbox is a meant to be a quick guide and project level analysis is required to determine the feasibility and appropriateness of a specific facility given the physical characteristics of the project area.

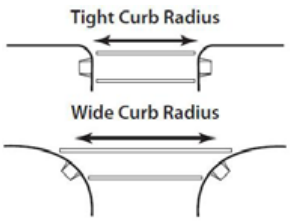
There are a number of excellent resources available that provide more detailed guidance on the planning and design of pedestrian facilities. These include AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities (2004), WisDOT Guide to Pedestrian Best Practices (2010), NACTO Urban Street Design Guide (2013), ITE Designing Walkable Urban Thoroughfares (2010), FHWA Manual on Uniform Traffic Control Devices (MUTCD), and the U.S. Access Board Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (2011). FHWA issued a memorandum in 2013 expressing support for taking a flexible approach to pedestrian and bicycle facility design, citing the NACTO and ITE guides, which build upon the flexibilities provided in the AASHTO guides.

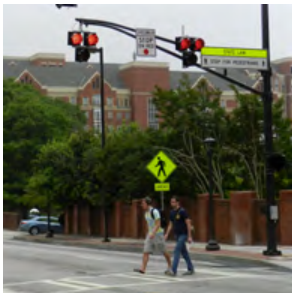
Pedestrian Facilities Toolbox

Treatment	Description	Benefits	Application / Consideration	Cost
Primary Facility and Street Design				
Sidewalk 	Designated, paved active transportation areas that are constructed along roadways in most residential neighborhoods and commercial areas.	Provide pedestrians with safety from motor vehicles, mobility, and support healthier communities.	Consider in all residential and commercial areas as well as areas in which pedestrian connectivity may be hindered by a lack of connecting facilities.	$$

Treatment	Description	Benefits	Application / Consideration	Cost
Shared-Use Path 	Facilities that are fully separated from roadways and only to non-motorized traffic. Typically located along former rail corridors or natural features.	Minimize conflicts between pedestrians and vehicles by complete separation of modes. Generally provide higher-level of aesthetics than sidewalks.	Consider in scenic or high-traffic areas where right-of-way is or has the potential to become available.	$$$
Pedestrian Overpass / Underpass 	A roadway overpass that provides complete separation for active transportation traffic from vehicular traffic.	Allows for the uninterrupted flow of pedestrian movement separate fro vehicle traffic.	Consider only in areas where pedestrians must cross a high-speed, high-volume multilane arterial or freeway.	$$ $$$
Traffic Calming Treatments 	Treatments including speed humps, mini-circles, and visual treatments which slow the speed of vehicular traffic.	Slowing traffic reduces accidents and accident severity, while commonly providing an aesthetic benefit.	Treatment applications can range from temporary to permanent. Consider on low volume streets. May need to consider the impact to transit and emergency vehicles.	$ $$$
Intersections and Street Crossings				
Unmarked Crosswalk 	Pedestrian crossings that include ADA feature such as curb ramps, but do not include roadway markings.	Reduced maintenance costs in comparison to marked sidewalks.	Consider in low traffic volume residential areas.	$

Treatment	Description	Benefits	Application / Consideration	Cost
Marked Crosswalk 	Designated pedestrian crossings at pedestrian generators, crossings with significant pedestrian volumes, or places with high vehicle/pedestrian safety concerns.	Marked crosswalks provide a clear signal to both pedestrians and vehicles that an areas is a pedestrian channel across a roadway.	Can be installed on any road; however, they should not be installed alone on multi-lane roads with more than 10,000 vehicles per day.	$
Raised Crosswalk  *Source: FHWA*	Marked crosswalks that are raised above normal street level, simultaneously acting as a traffic calming device.	Provide increased levels of safety in comparison to simple marked crosswalks and increase pedestrian comfort for those walking along busy corridors.	Consider on streets with moderate levels of traffic where highly trafficked pedestrian areas cross a roadway.	$$
Staggered Median Pedestrian Island  *Source: FHWA*	A variety of a pedestrian island in which pedestrians reach and island in the center of a roadway and then are directed towards traffic to reach the second half of the crosswalk.	Increases the concentration of pedestrians crossing a roadway while improving pedestrian visibility for motorists.	Consider on multi-lane roads with obstructed pedestrian visibility or those with off-set intersections. Must be designed for accessibility by including ADA considerations, such as railings for the visually impaired.	$$$
Median Refuge Island 	This treatment involves creating a raised island in the center of a roadway with cutouts for accessibility along the pedestrian path, creating a refuge for people crossing a roadway	Allows pedestrians to focus attention on each direction of traffic separately and reduces the length of time a pedestrian is exposed to oncoming traffic. Particularly effective on multilane roadways at accommodating ADA pedestrian traffic.	Recommended for busy multilane roads or high traffic two-lane arterials.	$$$

Treatment	Description	Benefits	Application / Consideration	Cost
Reduced Curb Radii  *Source: FABB*	The radius of a curb is reduced to require motorists to make a tighter turn, thus slowing speeds.	Reducing the radii narrows the distance pedestrians have to cross, reduces speeds around corners, and increases driver awareness of pedestrians.	Consider on streets with high pedestrian activity or those with on-street parking. May need to consider the impact to transit, freight vehicles, and bicyclists.	$$$
Pedestrian Bump-out / Curb Extension  *Source: Bike Ped Images*	This roadway treatment increases the pedestrian space by providing a physical extension of the sidewalk into a roadway.	This treatment narrows the distance a pedestrian has to cross, reduces pedestrian exposure time, increases sidewalk space on corners, improves visibility of pedestrians, and lowers turning speeds.	Suitable for roadways that have parking lanes, so long as bump-out extends only as far as parking lane. May need to consider impact to transit, freight vehicles, and bicyclists.	$$$
Signals and Signs				
Rapid Flashing Beacon  *Source: FHWA*	Amber LED lights that rapidly flash when a pedestrian crosses at a marked crosswalk.	High motorist compliance rate (65-80%) leads to great safety benefits. Can be installed with solar panels in places that lack electricity.	Consider for single lane roadways. Can be used on multi-lane roadways; however, effectiveness decreases as the number of travel lanes increases.	$$
Overhead Flashing Beacons  *Source: Iowa State University*	Flashing amber lights that are installed with overhead signs ahead or at crosswalk to alert motorists of the crosswalk.	The blinking lights increase the number of drivers that yield to pedestrians, ultimately increasing pedestrian safety.	Consider in places with visibility issues or topographic limitations.	$$$

Treatment	Description	Benefits	Application / Consideration	Cost
Pedestrian Hybrid Beacon (HAWK)  *Source: Georgia Tech University*	A pedestrian-actuated beacon that is part beacon flasher and part traffic control signal. Upon actuation, beacon displays a yellow warning indication followed by a red stop light. Driver seed a flashing red as the pedestrian crosses until the clearance interval has ended.	High compliance rate (80-90%) leads to great safety benefits.	Consider in places where it is difficult for pedestrians to find breaks in vehicular traffic, but where normal signal warrants are not met. Not appropriate for single lane roadways due to cost.	$$ $$
Pedestrian Countdown signs  *Source: FHWA*	A signal head that displays the amount of time remaining for a pedestrian to cross the road during the pedestrian clearance interval.	Reduces pedestrian/vehicle crashes by 25% and slows traffic speeds.	This treatment is required by the MUTCD for all signalized intersections with pedestrian signal heads.	$$
High Visibility Signs and Markings  *Source: Bike Ped Images*	Brightly colored signs that are posted at pedestrian crossings to increase driver awareness of the crossing.	Can increase driver awareness in an areas where drivers need to exercise higher levels of caution based on potential conflicts with pedestrians	Beneficial in areas where a pedestrian crossing might be expected or where pedestrian conflicts have occurred at higher-than-average rates.	$
In-street Pedestrian Crossing Signs  *Source: Bike Ped Images*	Regulatory signage posted on road edge lines and road centerlines that remind drivers of laws regarding right of way at unsignalized pedestrian crossings.	The signs are highly visible to motorists and have been show to have a positive impact on pedestrian safety due to high drive compliance. However, compliance decreases on multilane roadways.	Potential applications include mid-block crosswalks, unsignalized intersections, and low-speed areas on two-lane roadways. These type of signs may need to be removed during winter months.	$

Treatment	Description	Benefits	Application / Consideration	Cost
Advanced Yield Lines  *Source: UCTC SRTS*	A row of white yield lines that are placed before crosswalks at uncontrolled intersections or mid-block crossings.	The markings can increase a pedestrian's visibility to motorists while reducing the number of motorists encroaching on a sidewalk by indicating where a driver should stop.	Beneficial in areas where pedestrian visibility is low or drivers are aggressive.	$

APPENDIX G: PUBLIC PARTICIPATION AND RESPONSES TO COMMENTS

Introduction



Public participation is an important part of the long-range planning process. Because of this, the Regional Transportation Plan 2050 included multiple opportunities for area residents to voice their opinions and provide feedback throughout the planning process – online and off.

Online activities were introduced in three phases:

- Phase one included the Greater Madison Region Values and Priorities survey, the launch of the RTP website, and community mapping application
- Phase two included the launch of the draft plan review application
- Phase three included the launch of the budget simulator application and a second community mapping application

In-person activities included three series of public information meetings appearances at community events, presentations to community groups, and a public hearing. A summary of these public engagement activities can be found in Chapter 1.

The following is a summary of the materials presented online and at the public information meetings and includes:

- Priorities and Values of the Madison Region
- Public Involvement Meeting #1 – Kickoff Meeting Presentation
- Public Involvement Meeting #1 – Group questions
- Public Involvement Meeting #1 – Goals for Group Activity
- Public Involvement Meeting #1 – Revised Goals following group activity
- Public Involvement Meeting #1 – Website summary of meeting activities
- Public Involvement Meeting #1 – Presentation Boards
- Public Involvement Meeting #2 – Meeting Presentation
- Public Involvement Meeting #2 – Table Maps
- Public Involvement Meeting #2 – Presentation Boards
- Public Involvement Meeting #3 – Draft RTP Meeting Presentation
- Public Involvement Meeting #3 – Presentation Boards
- RTP Website
  - Community Mapping Application
  - Budget Simulator Application
  - Draft Chapter Comment and Review Application
  - Recommendation Review Application
- Responses to Other Comments

HEART MIND STRATEGIES a Wirthlin inspired consultancy

Priorities and Values of the Madison Region

Quantitative Study Results

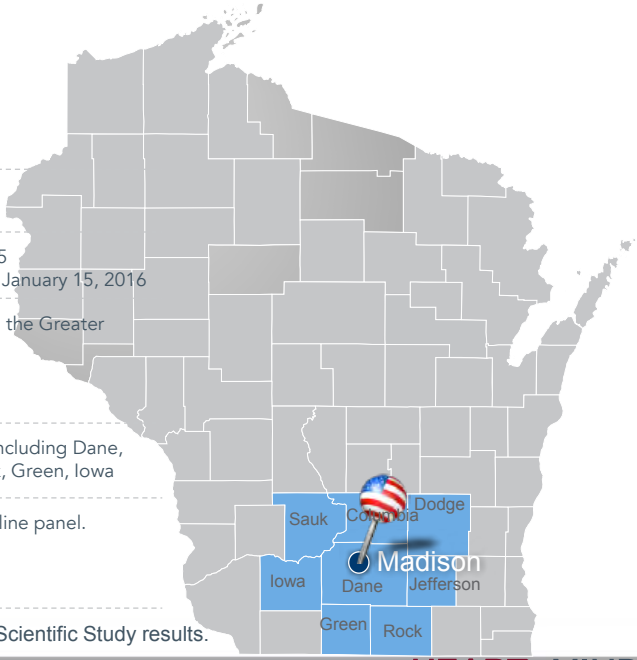
Prepared for A Greater Madison Vision and Madison Area Transp. Planning Board

February, 2016



Methodology

MODE	Online Scientific Study Survey Online Open Link Public Survey
LENGTH	20 minutes
INTERVIEW DATES	Scientific Study: December 08 – 22, 2015 Open Link Public: December 17, 2015 – January 15, 2016
AUDIENCE	Scientific Study: n=570 Residents within the Greater Madison Region n=457 Dane county n=113 Non-Dane county Open Link Public: n=1179
GEOGRAPHY	Scientific Study: 8 Wisconsin Counties including Dane, Sauk, Columbia, Dodge, Jefferson, Rock, Green, Iowa
RESPONDENT CRITERIA	Scientific Study sample sourced from online panel. Screening Criteria: • Live within 8 county region • At least 18 years of age



Pg. 2

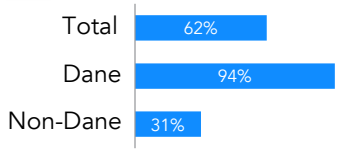
This presentation of findings focuses primarily on the Scientific Study results.

Quotas were enforced among Scientific Study member participants in an effort to reflect census data for the region. Due to an over representation of Dane county residents, final Scientific Study sample was weighted on county (Dane vs. non-Dane), gender and age to align with census data.

HEART MIND STRATEGIES

What is the Greater Madison Region?

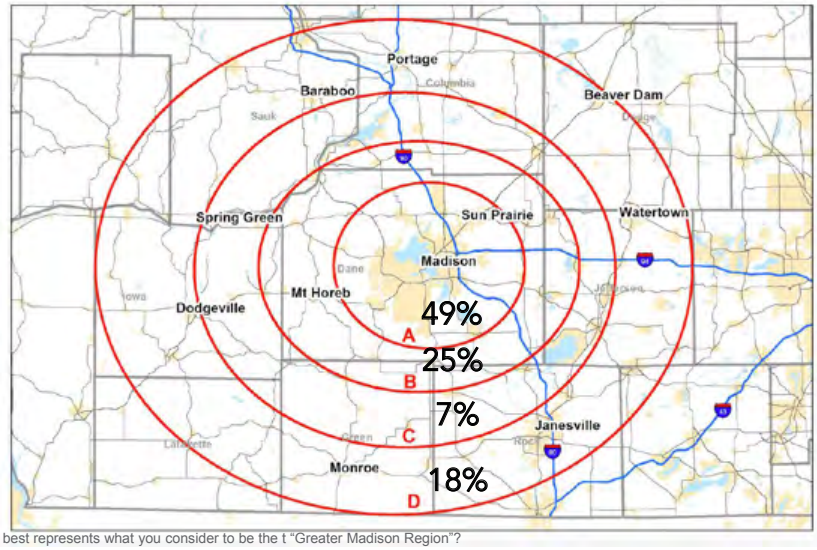
Live in Greater Madison Region?



What Best Represents Greater Madison Region?

	Total
A	49%
B	25%
C	7%
D	18%

Represents Greater Madison Region

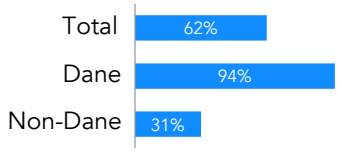


Pg. 3

BASE: ALL RESPONDENTS (n=570)
On the map below, which of the following areas best represents what you consider to be the t "Greater Madison Region"?
Do you live in the Greater Madison Region?

What is the Greater Madison Region?

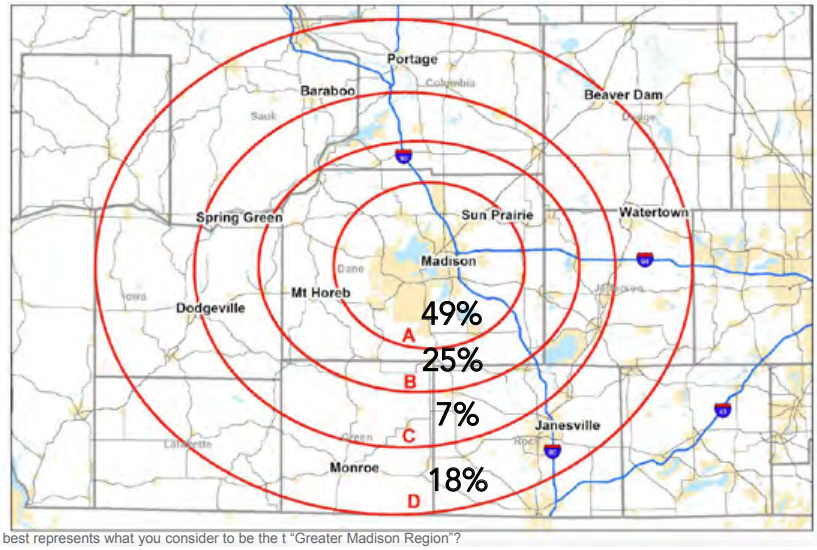
Live in Greater Madison Region?



What Best Represents Greater Madison Region?

	Total	Dane	Non-Dane
A	49%	66%	33%
B	25%	27%	24%
C	7%	4%	10%
D	18%	3%	34%

Represents Greater Madison Region



Pg. 4

BASE: ALL RESPONDENTS (n=570)
On the map below, which of the following areas best represents what you consider to be the t "Greater Madison Region"?
Do you live in the Greater Madison Region?

SCIENTIFIC VALUES STUDY DETAILED FINDINGS

YOUR GOALS WITH INNOVATIVE RESEARCH WE HELP YOU
UNDERSTAND HOW TO ENGAGE THE HEARTS AND MINDS O
PEOPLE THAT MATTER MOST TO ACHIEVING YOUR GOALS

Pg. 5

Key Findings

1. Greater Madison Region quality of life.
2. Growth
3. Regional Priorities
4. Personal Priorities and Values
5. Specific visioning approaches
6. Regional transportation approaches

Pg. 6

HEART+MIND STRATEGIES

Key Findings #1:

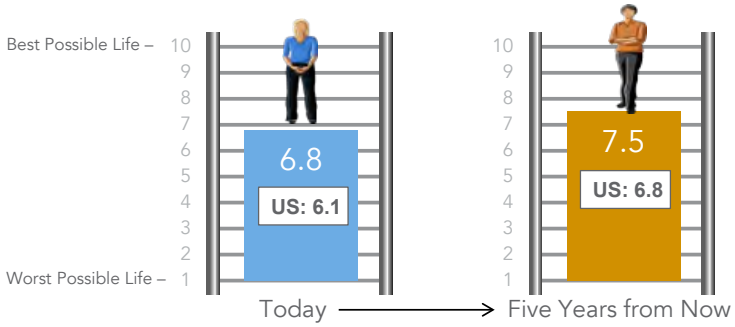
Greater Madison Region residents enjoy a high quality of life and have a relatively positive outlook—well above the national average. Still a ways to go on economic recovery and getting everything moving in the right direction.

Pg. 7

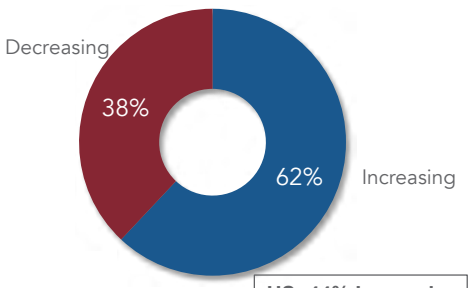
HEART+MIND STRATEGIES

Residents in Greater Madison see their quality of life increasing, both for them and their children in the future

Ladder of Life
Mean Scores



Quality of Life for Next Generation



US: 44% Increasing
56% Decreasing

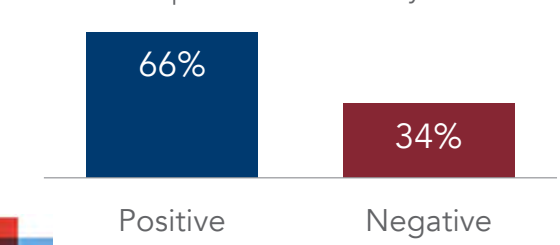
Pg. 8

Thinking about the overall quality of your life here in this region, please imagine a ladder with ten steps representing the "ladder of life." On a scale of 1 to 10, on which step of the ladder do you personally stand at the present time?
Just as your best guess, on which step will you stand in the future, say about five years from now?
Thinking about the quality of life that will be here for you or your friends' children and grandchildren, do you see their quality of life in the Greater Madison Region increasing or decreasing in the future?

A majority of residents see the aspects of the community as positive, yet are more divided on the current direction of the community

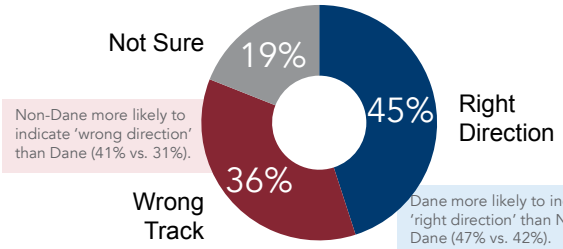


Ratio of Positive to Negative Aspects of Community





Direction of Community



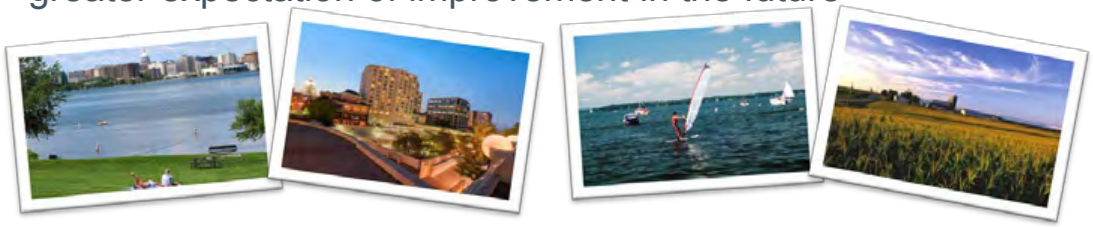
Non-Dane more likely to indicate 'wrong direction' than Dane (41% vs. 31%).

Dane more likely to indicate 'right direction' than Non-Dane (47% vs. 42%).

Pg. 9

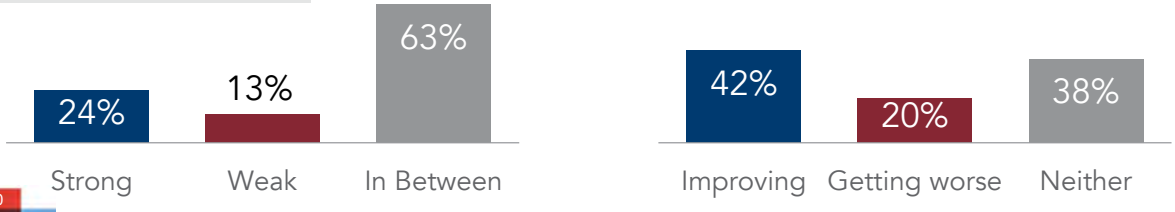
Thinking of all the positive and negative aspects about the quality of life here in the region, what percentage of things would you classify as positive? What percentage is negative? On another subject, do you feel things in your own community today are going in the right direction or do you feel things have pretty seriously gotten off on the wrong track?

Most believe the local economy is performing averagely, with a greater expectation of improvement in the future



Impression of Local Economy

Dane county has more positive view of the current economy with 34% describing it as 'strong' vs. only 14% in Non-Dane.



Pg. 10

Based on what you are seeing and hearing from others in the community, would you say your region's local economy is strong, weak, or somewhere in between? Do you think your local economy is improving or getting worse?

Key Findings #2:

While growth is viewed as inevitable, most believe it brings benefits and should be encouraged.

Pg. 11

HEART+MIND STRATEGIES

Growth is inevitable and the best thing to do is prepare for it



Pg. 12

Please indicate which of these points of view most closely reflects your own:

6 in 10 believe "lots more growth will be coming to this region whether we want it or not—the best thing we can do is plan and prepare for it."

Groups most likely to believe growth is inevitable:

- 78% Dane county
- 77% African American/Hispanics
- 77% Live in city of Madison
- 72% Live in Greater Madison region
- 71% Ages 35-44 & 65+

4 in 10 believe "the amount of growth that comes to this region is up to us. If we don't want more growth we can stop it."

Groups most likely to believe growth is within our control:

- 55% High school education or less
- 49% Non-Dane county
- 48% Do not live in Greater Madison region

Growth brings benefits and advantages and should be encouraged



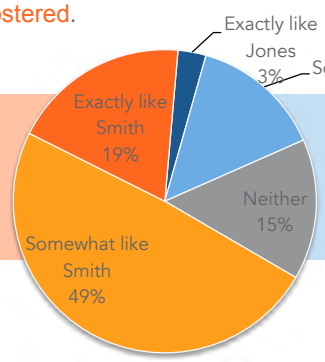
67%

Smith believes that growth in this region has and will continue to bring many benefits and advantages to the region. Smith believes that growth should be strongly encouraged and fostered.

17%

Jones believes that growth in this region has and will continue to jeopardize the quality of life for residents. Jones believes that growth should be strictly managed or limited.





86% Ages18-24
74% In Region 1-5 Years
73% Income $100k+
72% Age 65+

High school education or less 26%
Do not live in Greater Madison region 23%
Age 55-64 22%

Pg. 13

Below are the opinions of two hypothetical residents. Is your opinion more like Smith or more like Jones?

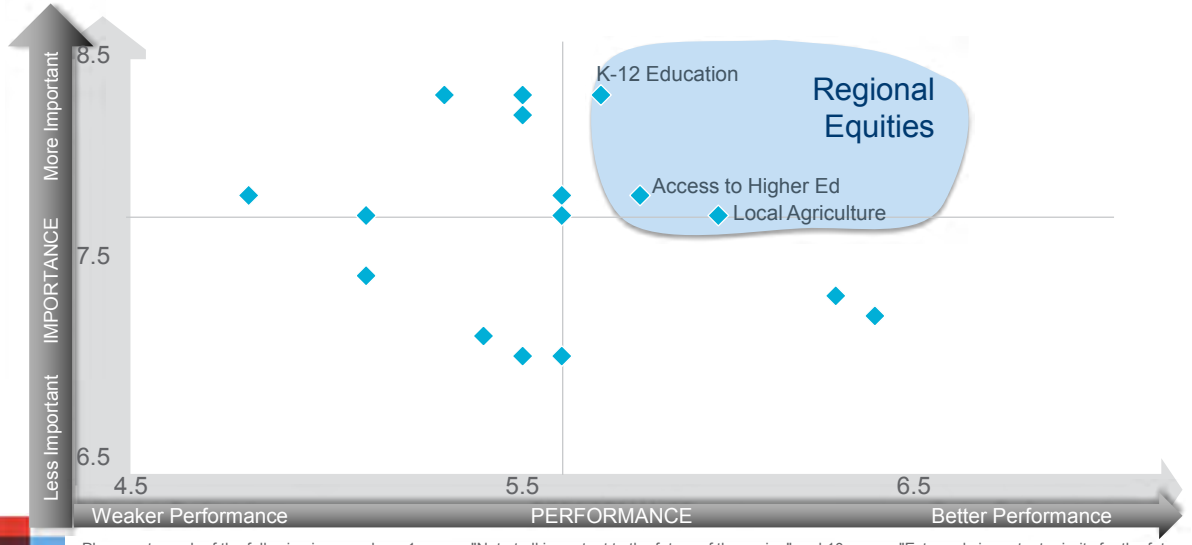
Key Findings #3:

Education (K-12 and Higher Ed) and Agriculture are seen as the top REGIONAL equities. Jobs, Income Inequality, Affordable Housing, Crime, and Access to Healthcare are top regional challenges.

Pg. 14

HEART+MIND STRATEGIES

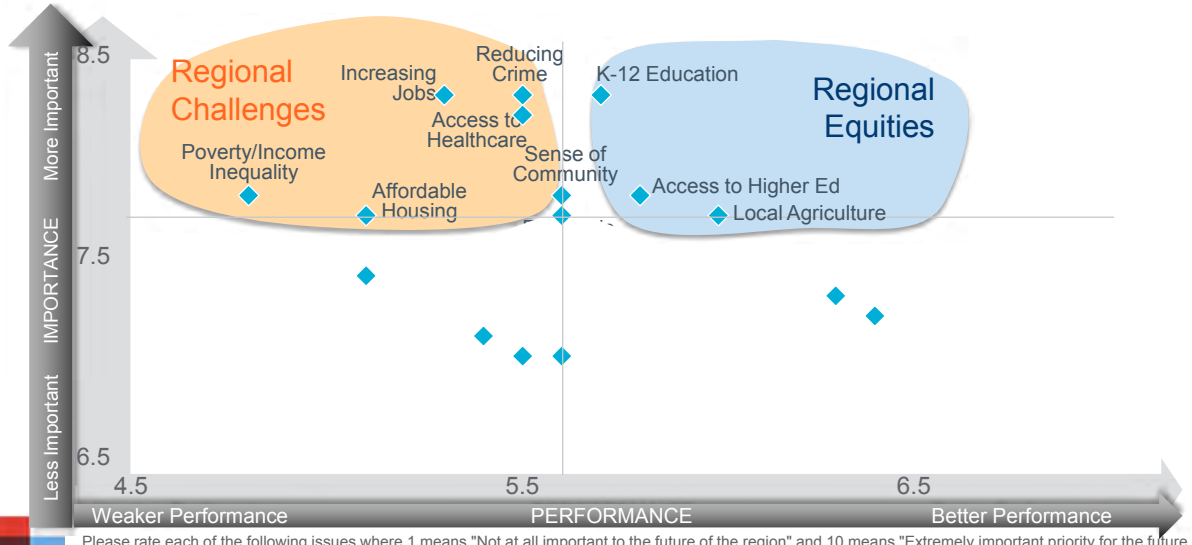
Importance and Performance of Region Priorities



15

Please rate each of the following issues where 1 means "Not at all important to the future of the region" and 10 means "Extremely important priority for the future of the region":
Please indicate how well you think we are doing as a region on each of these priorities using the scale where 1 means the region is not performing well at all and 10 means the region is performing extremely well.

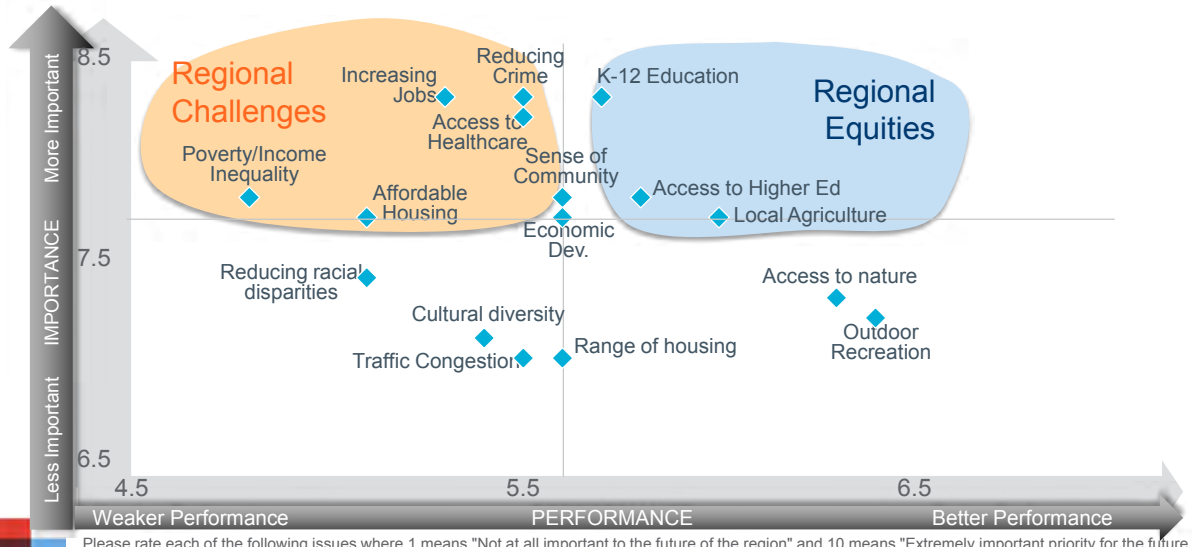
Importance and Performance of Region Priorities



16

Please rate each of the following issues where 1 means "Not at all important to the future of the region" and 10 means "Extremely important priority for the future of the region":
Please indicate how well you think we are doing as a region on each of these priorities using the scale where 1 means the region is not performing well at all and 10 means the region is performing extremely well.

Importance and Performance of Region Priorities



17

Please rate each of the following issues where 1 means "Not at all important to the future of the region" and 10 means "Extremely important priority for the future of the region":
Please indicate how well you think we are doing as a region on each of these priorities using the scale where 1 means the region is not performing well at all and 10 means the region is performing extremely well.

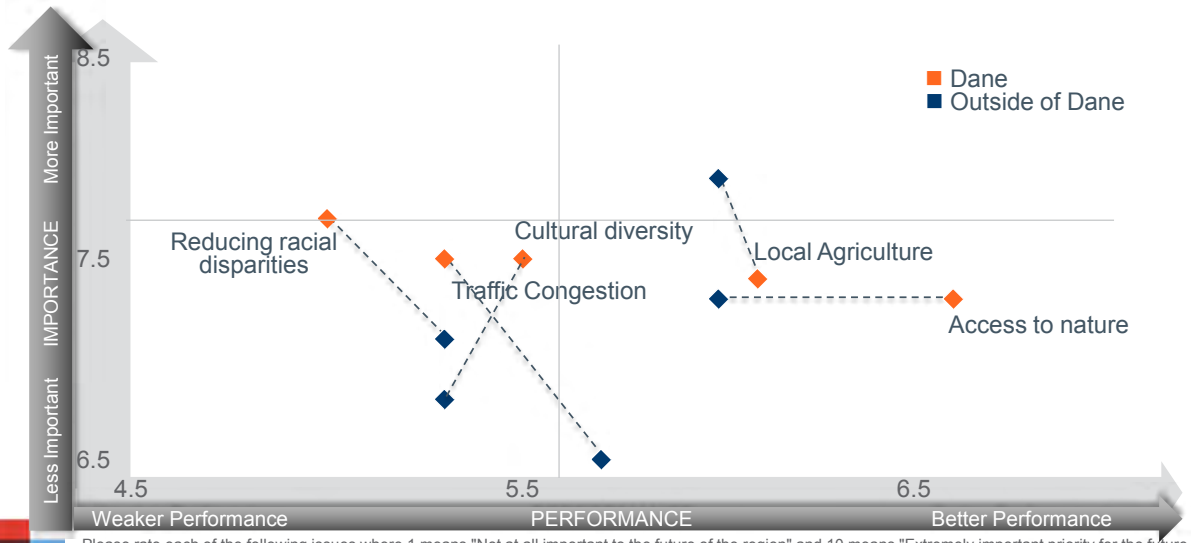
Dane and Non-Dane Differences



18

Please rate each of the following issues where 1 means "Not at all important to the future of the region" and 10 means "Extremely important priority for the future of the region":
Please indicate how well you think we are doing as a region on each of these priorities using the scale where 1 means the region is not performing well at all and 10 means the region is performing extremely well.

Dane and Non-Dane County Differences



19

Please rate each of the following issues where 1 means "Not at all important to the future of the region" and 10 means "Extremely important priority for the future of the region":
Please indicate how well you think we are doing as a region on each of these priorities using the scale where 1 means the region is not performing well at all and 10 means the region is performing extremely well.

Key Findings #4:

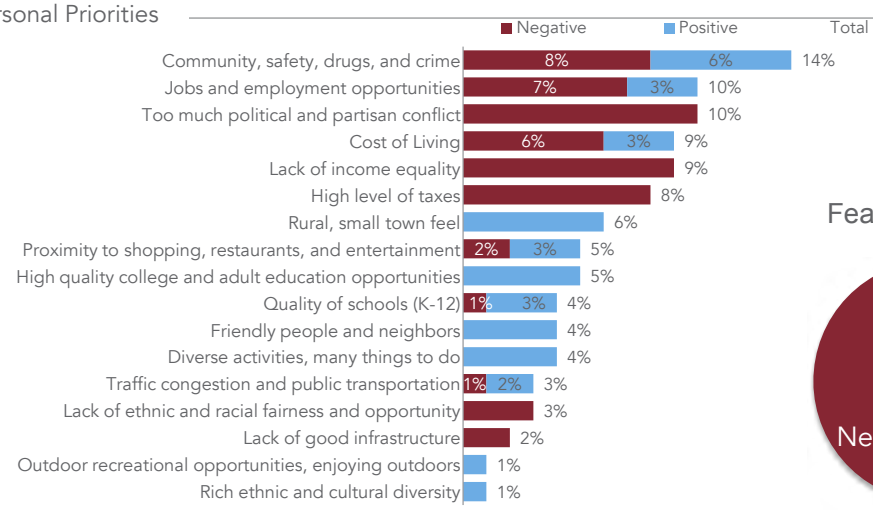
One narrative dominates the PERSONAL values orientation of residents in the Greater Madison Region: Financial Well Being/Security. Two other orientations also define the values of the region: Personal Security and Sense of Community.

Pg. 20

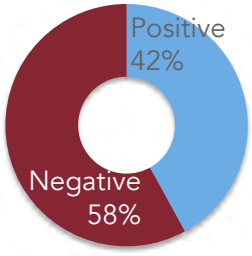
HEART+MIND STRATEGIES

Negative factors, most closely related to financial well being and security, are the most significant factors impacting quality of life in the Greater Madison Region

Personal Priorities



Features Selected



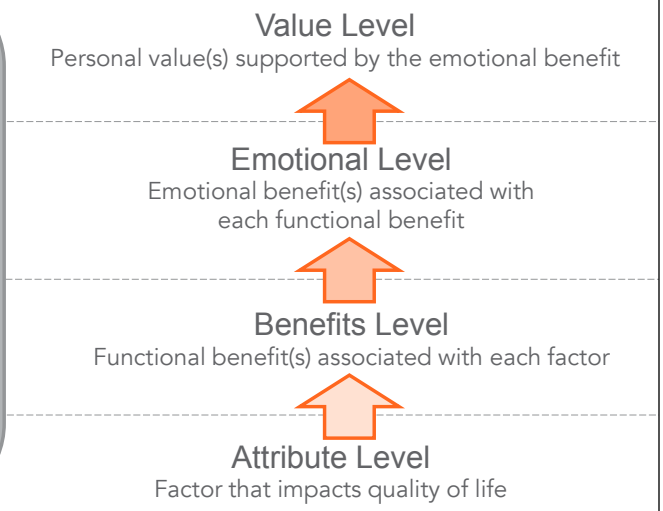
Pg. 21

The people of this region have mentioned many factors—both positive and negative—that contribute to or detract from their quality of life. Thinking about the quality of life in this region, please identify which one (either a positive or a negative factor) of the following factors has the most significant impact on the overall quality of life for you personally. Take your time and be sure to select the one (positive or negative) that has the most significant impact on you personally.

Understanding the Consequences of Factors

Factors are mapped to their corresponding functional and emotional benefits and then linked to which personal value they most effectively support.

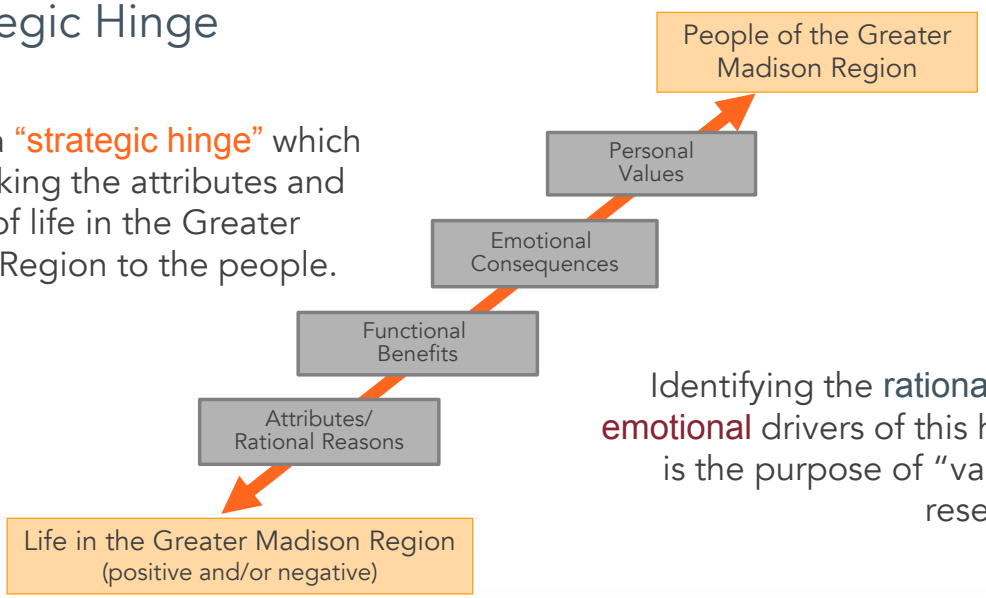
This creates a blueprint for finding the most effective areas to improve quality of life and the personal benefits that result from those improvements.



Pg. 22

Strategic Hinge

There is a "strategic hinge" which exists, linking the attributes and benefits of life in the Greater Madison Region to the people.



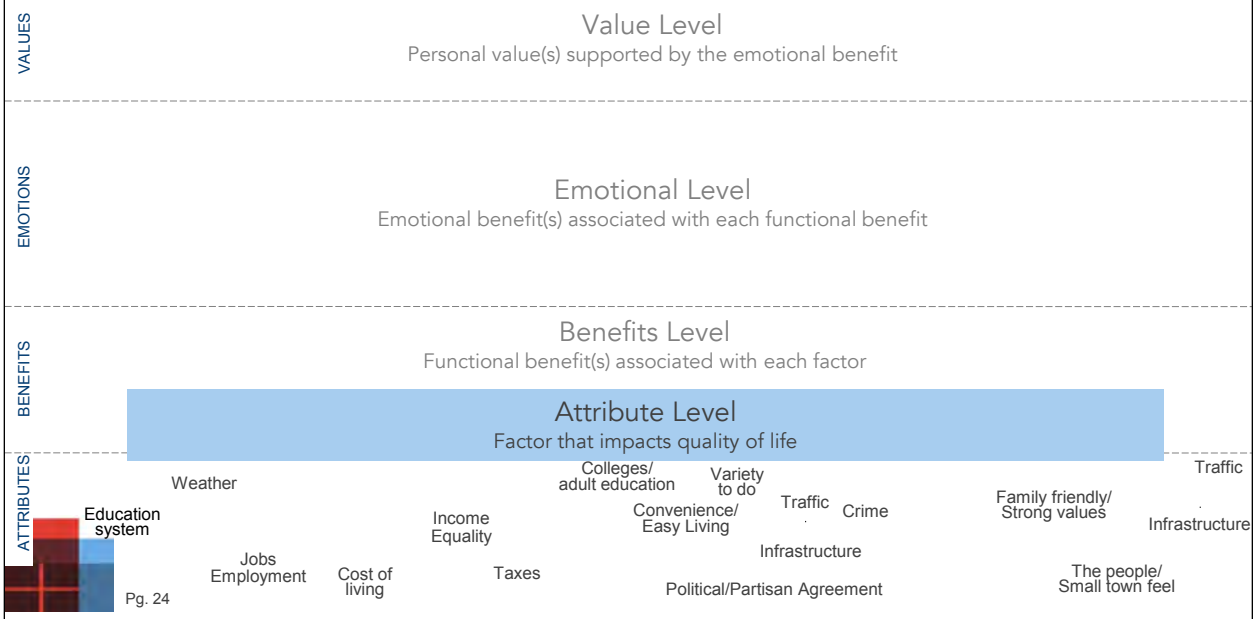
Identifying the rational and emotional drivers of this hinge is the purpose of "values" research.

Pg. 23

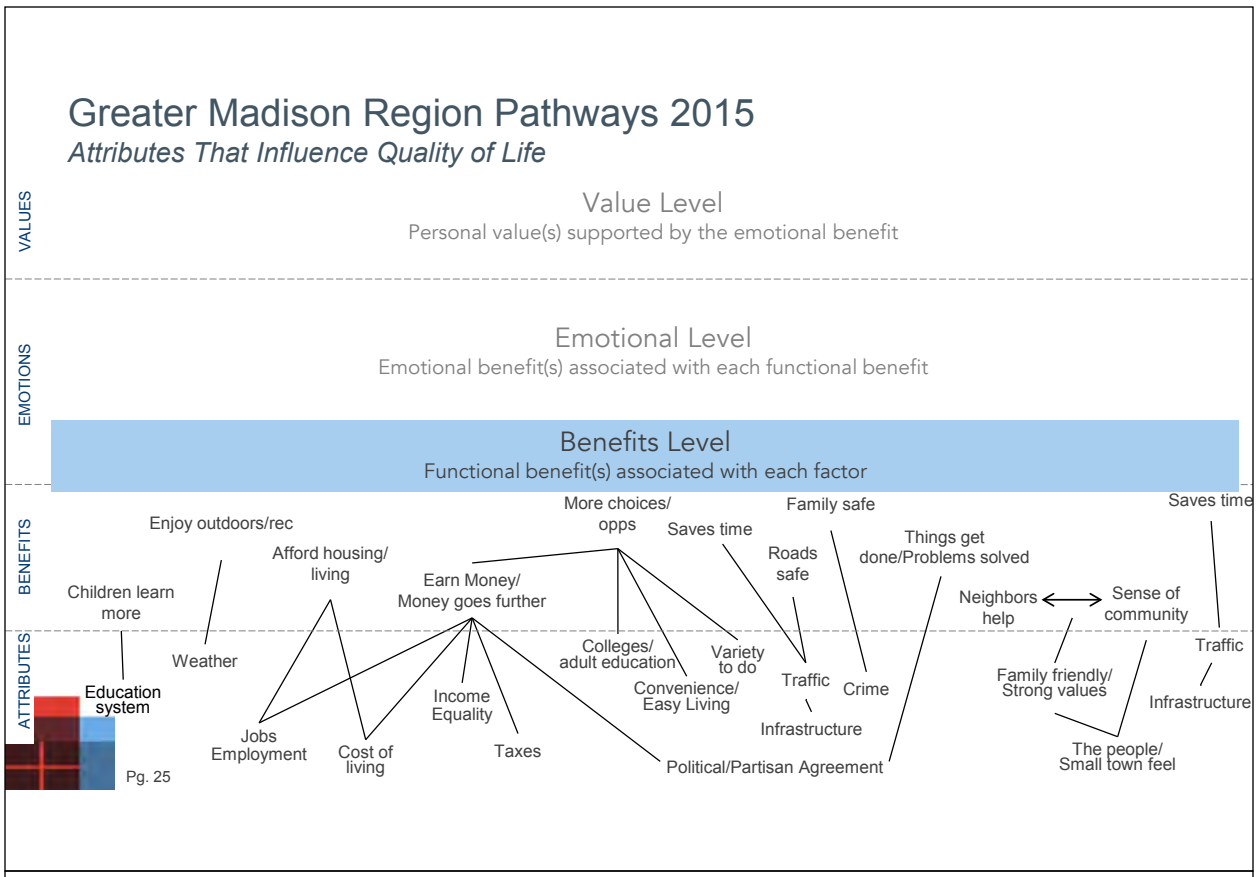
HEART+MIND STRATEGIES

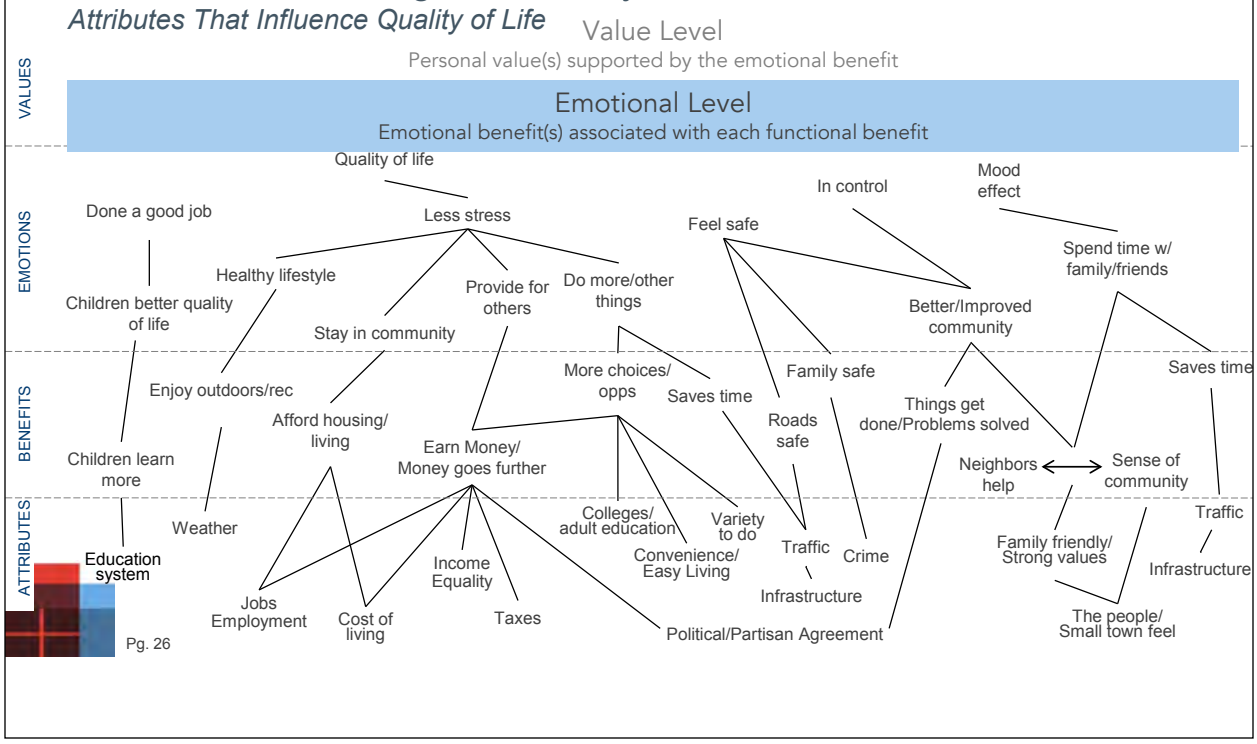
Greater Madison Region Pathways 2015

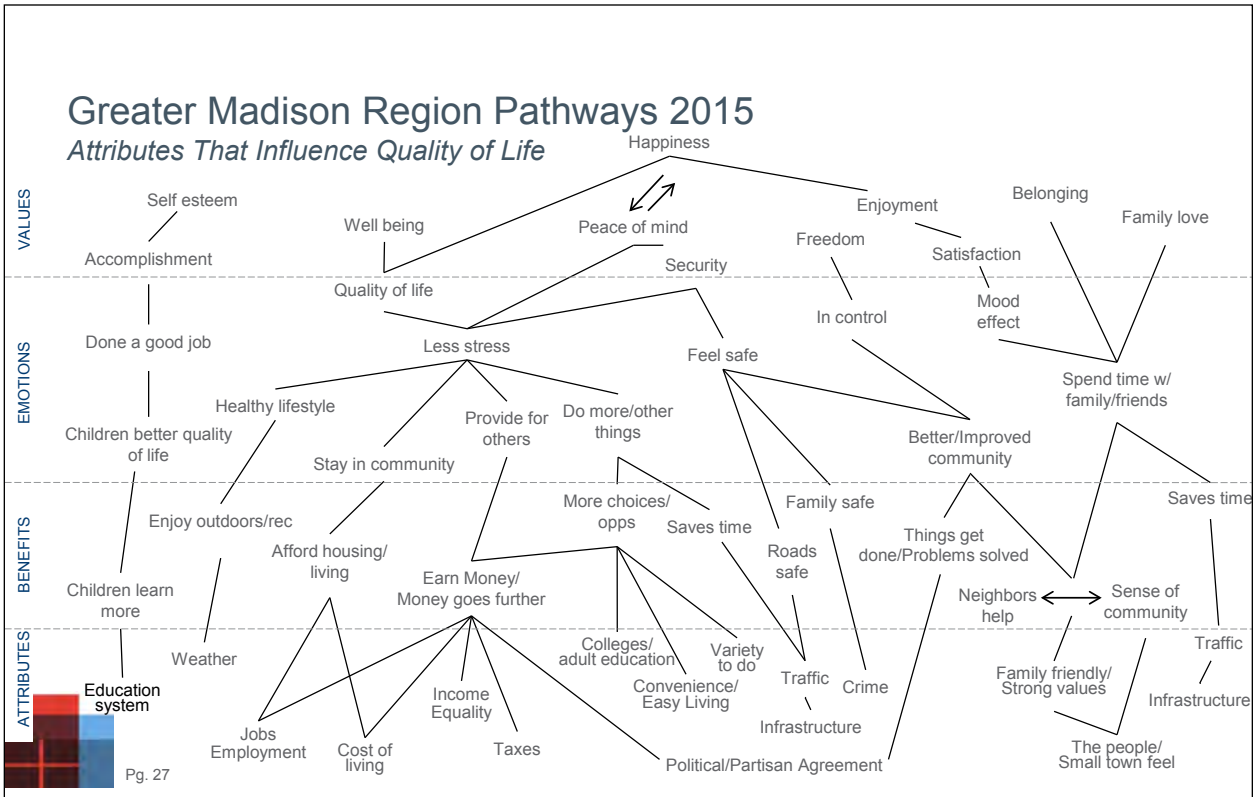
Attributes That Influence Quality of Life

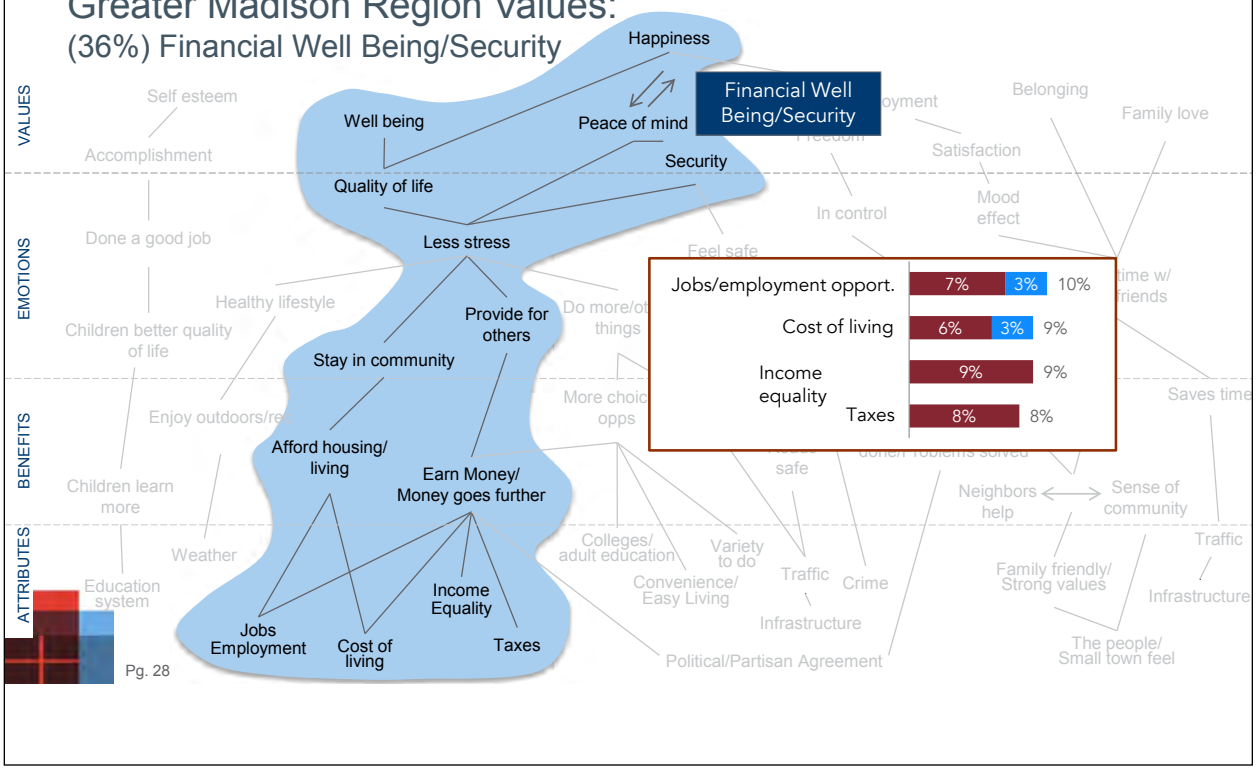


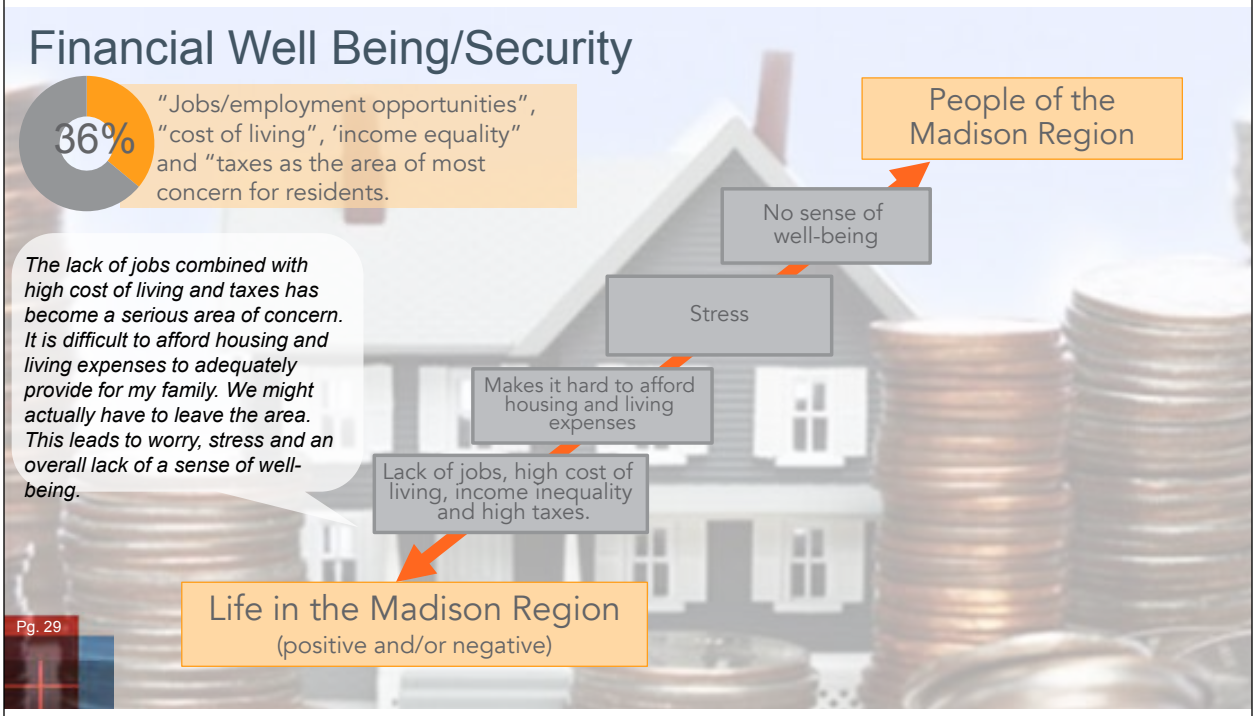
Pg. 24

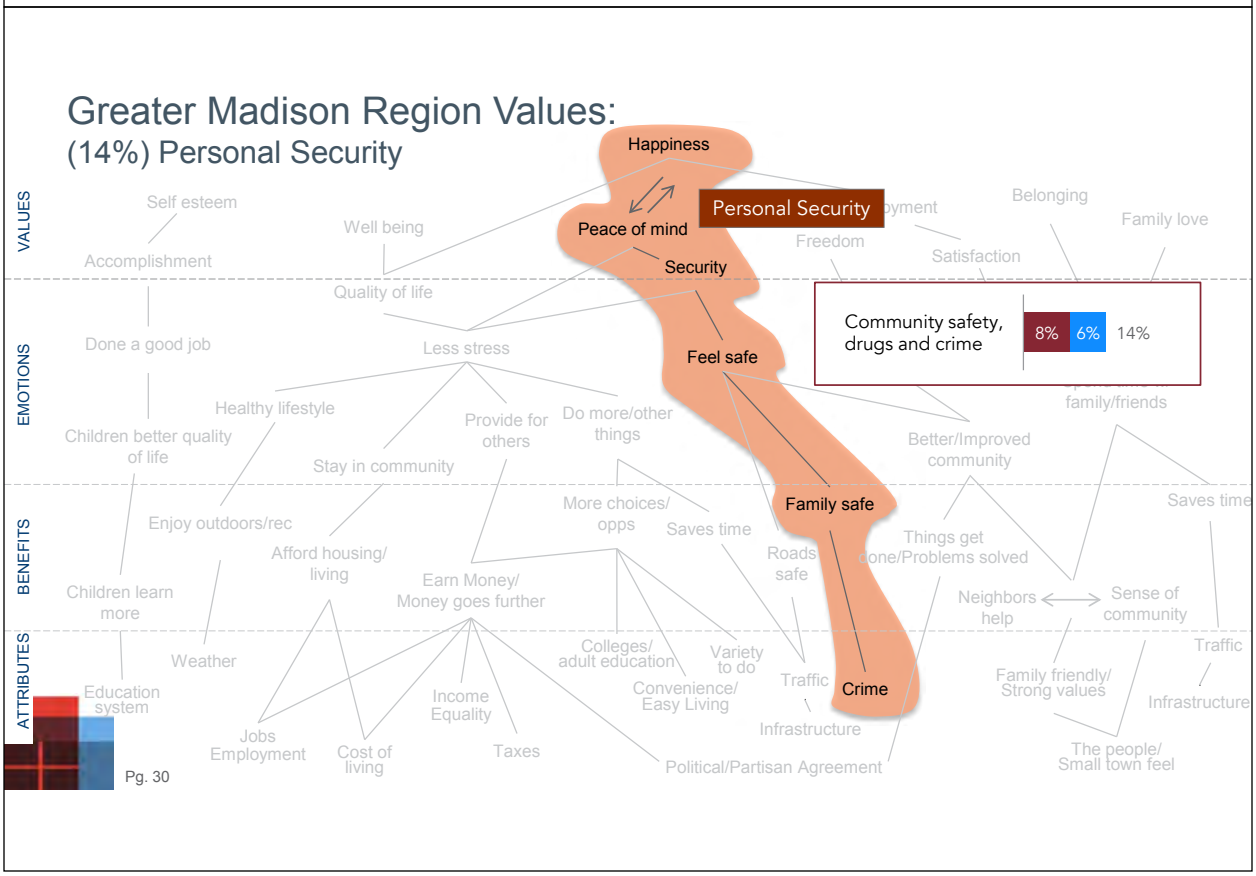

Greater Madison Region Pathways 2015
Attributes That Influence Quality of Life
VALUES
Value Level
Personal value(s) supported by the emotional benefit
EMOTIONS
Emotional Level
Emotional benefit(s) associated with each functional benefit
BENEFITS
Benefits Level
Functional benefit(s) associated with each factor
ATTRIBUTES
Enjoy outdoors/rec
Afford housing/ living
Children learn more
Earn Money/ Money goes further
More choices/ opps
Saves time
Family safe
Roads safe
Things get done/Problems solved
Neighbors help
Sense of community
Saves time
Traffic
Weather
Colleges/ adult education
Variety to do
Traffic
Crime
Family friendly/ Strong values
Infrastructure
Education system
Income Equality
Convenience/ Easy Living
Infrastructure
Jobs Employment
Cost of living
Taxes
Political/Partisan Agreement
The people/ Small town feel
Pg. 25

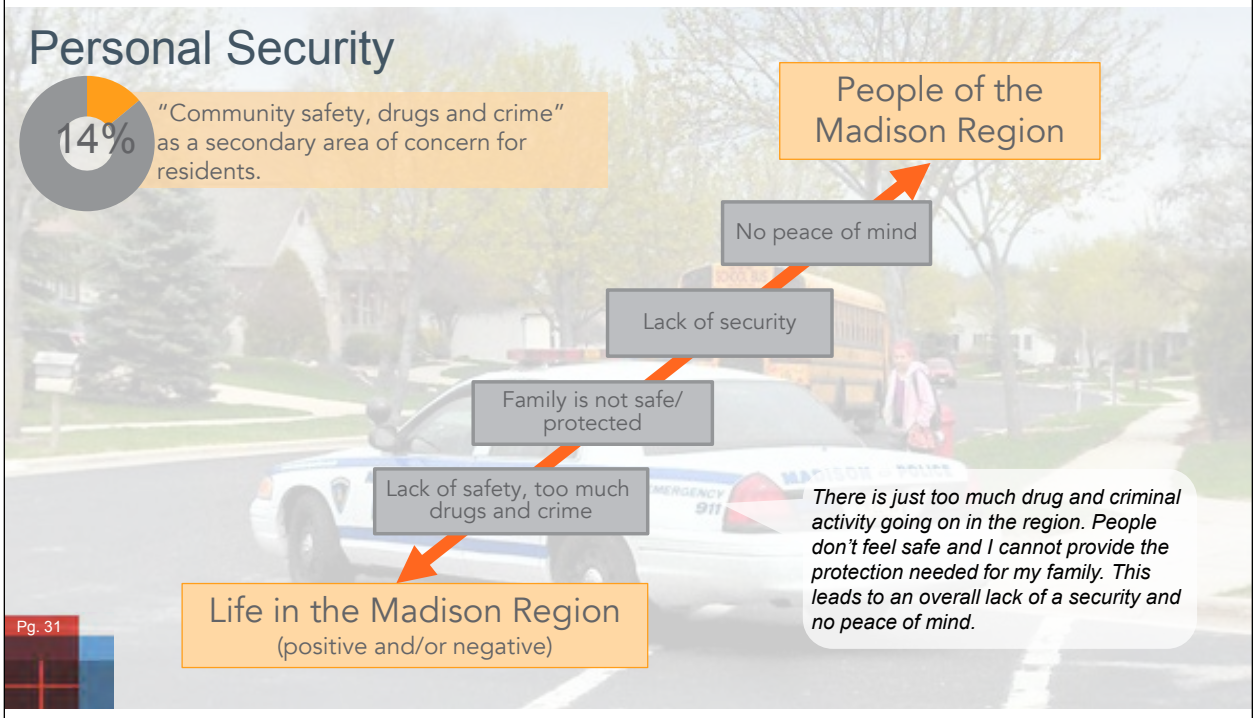

Greater Madison Region Pathways 2015
Attributes That Influence Quality of Life
VALUES
Value Level
Personal value(s) supported by the emotional benefit
EMOTIONS
Emotional Level
Emotional benefit(s) associated with each functional benefit
BENEFITS
ATTRIBUTES
Quality of life
In control
Mood effect
Done a good job
Less stress
Feel safe
Spend time w/ family/friends
Healthy lifestyle
Provide for others
Do more/other things
Children better quality of life
Better/Improved community
Stay in community
Enjoy outdoors/rec
More choices/ opps
Family safe
Saves time
Afford housing/ living
Saves time
Roads safe
Things get done/Problems solved
Children learn more
Earn Money/ Money goes further
Neighbors help
Sense of community
Weather
Colleges/ adult education
Variety to do
Traffic
Crime
Family friendly/ Strong values
Traffic
Education system
Income Equality
Convenience/ Easy Living
Infrastructure
Infrastructure
Jobs Employment
Cost of living
Taxes
Political/Partisan Agreement
The people/ Small town feel
Pg. 26

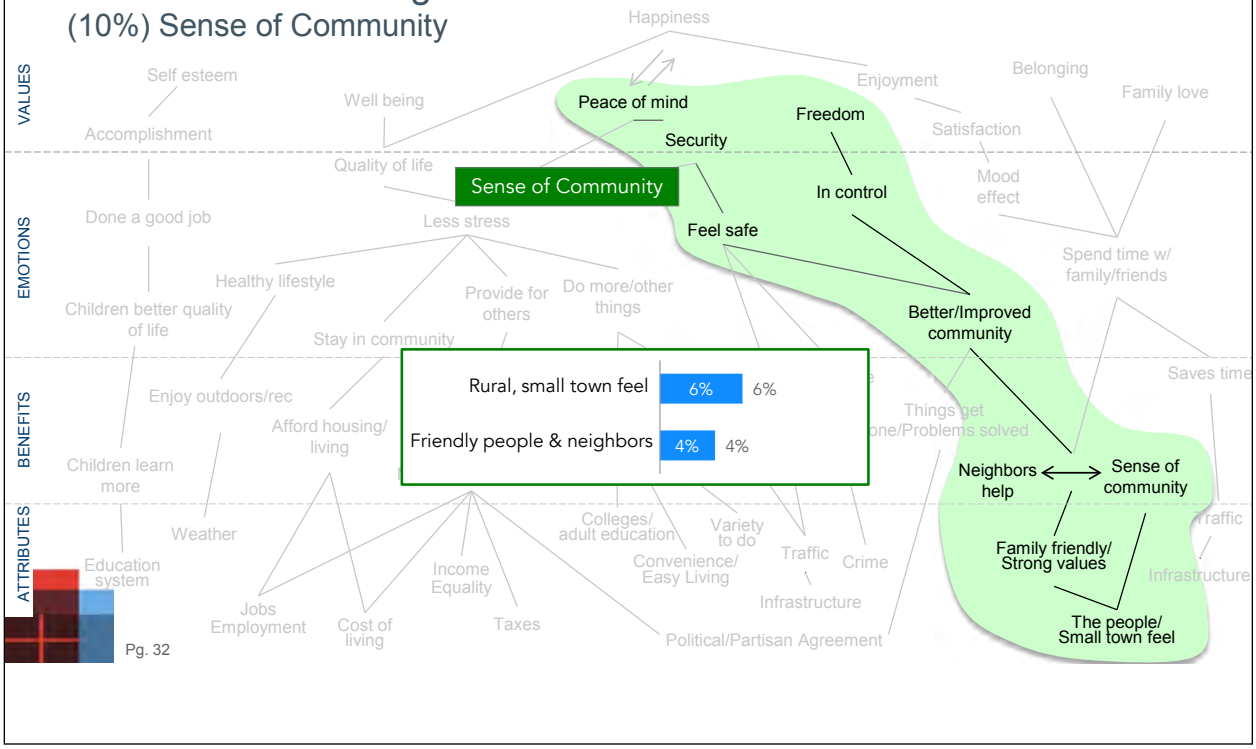

Greater Madison Region Pathways 2015
Attributes That Influence Quality of Life
VALUES
EMOTIONS
BENEFITS
ATTRIBUTES
Happiness
Self esteem
Well being
Peace of mind
Enjoyment
Belonging
Family love
Accomplishment
Quality of life
Security
Freedom
Satisfaction
Mood effect
Done a good job
Less stress
Feel safe
In control
Spend time w/ family/friends
Healthy lifestyle
Provide for others
Do more/other things
Children better quality of life
Stay in community
Better/Improved community
More choices/ opps
Family safe
Saves time
Enjoy outdoors/rec
Saves time
Things get done/Problems solved
Afford housing/ living
Roads safe
Children learn more
Earn Money/ Money goes further
Neighbors help
Sense of community
Traffic
Weather
Colleges/ adult education
Variety to do
Traffic
Crime
Family friendly/ Strong values
Infrastructure
Education system
Income Equality
Convenience/ Easy Living
Infrastructure
Jobs Employment
Cost of living
Taxes
Political/Partisan Agreement
The people/ Small town feel
Pg. 27

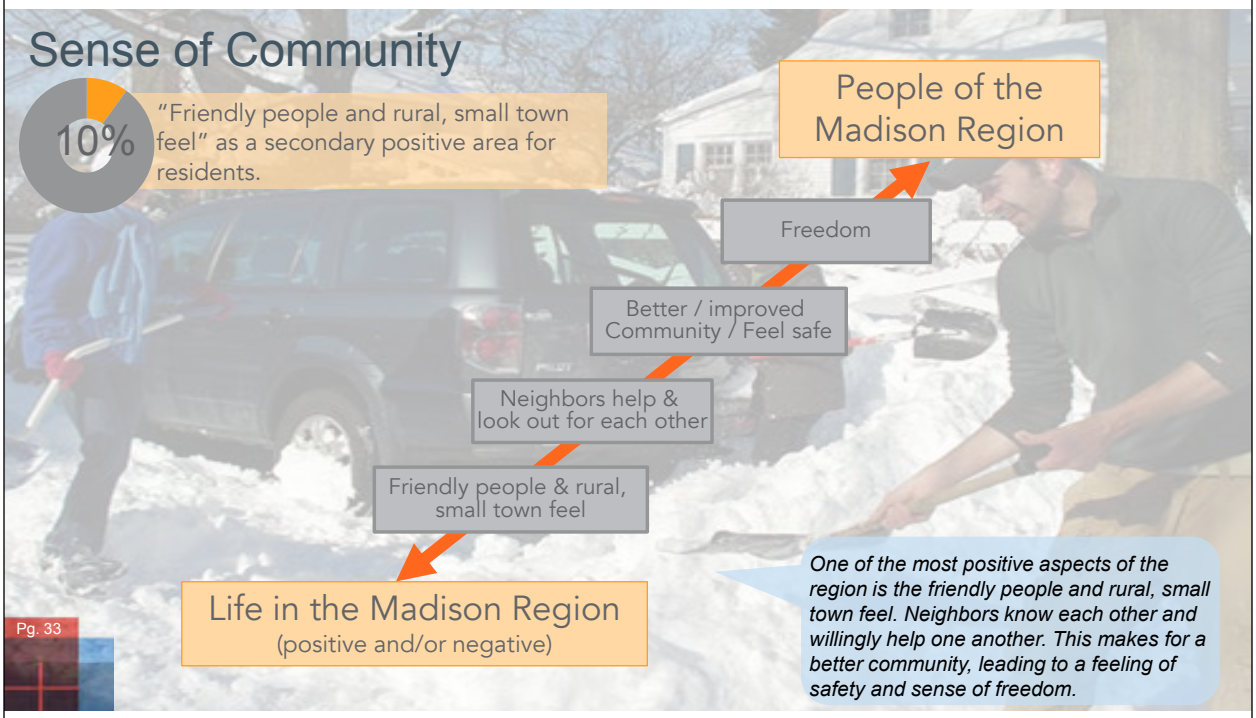

Greater Madison Region Values:
(36%) Financial Well Being/Security
Financial Well Being/Security
Jobs/employment opport. 7% 3% 10%
Cost of living 6% 3% 9%
Income equality 9% 9%
Taxes 8% 8%
Pg. 28


Financial Well Being/Security
36%
"Jobs/employment opportunities", "cost of living", 'income equality" and "taxes as the area of most concern for residents.
People of the Madison Region
No sense of well-being
Stress
Makes it hard to afford housing and living expenses
Lack of jobs, high cost of living, income inequality and high taxes.
The lack of jobs combined with high cost of living and taxes has become a serious area of concern. It is difficult to afford housing and living expenses to adequately provide for my family. We might actually have to leave the area. This leads to worry, stress and an overall lack of a sense of well-being.
Life in the Madison Region
(positive and/or negative)
Pg. 29


Greater Madison Region Values:
(14%) Personal Security
VALUES
EMOTIONS
BENEFITS
ATTRIBUTES
Happiness
Personal Security
Peace of mind
Security
Feel safe
Family safe
Crime
Self esteem
Accomplishment
Well being
Quality of life
Done a good job
Less stress
Healthy lifestyle
Children better quality of life
Provide for others
Do more/other things
Stay in community
Enjoy outdoors/rec
Afford housing/ living
Children learn more
Earn Money/ Money goes further
Weather
Education system
Jobs Employment
Cost of living
Income Equality
Taxes
More choices/ opps
Saves time
Colleges/ adult education
Convenience/ Easy Living
Variety to do
Traffic
Infrastructure
Roads safe
Political/Partisan Agreement
Freedom
Satisfaction
Belonging
Family love
Community safety, drugs and crime
8%
6%
14%
family/friends
Better/Improved community
Things get done/Problems solved
Neighbors help
Sense of community
Saves time
Family friendly/ Strong values
The people/ Small town feel
Traffic
Infrastructure
Pg. 30


Personal Security
14%
"Community safety, drugs and crime" as a secondary area of concern for residents.
People of the Madison Region
No peace of mind
Lack of security
Family is not safe/ protected
Lack of safety, too much drugs and crime
Life in the Madison Region
(positive and/or negative)
There is just too much drug and criminal activity going on in the region. People don't feel safe and I cannot provide the protection needed for my family. This leads to an overall lack of a security and no peace of mind.
Pg. 31


Greater Madison Region Values:
(10%) Sense of Community
VALUES
EMOTIONS
BENEFITS
ATTRIBUTES
Happiness
Self esteem
Well being
Enjoyment
Belonging
Family love
Accomplishment
Peace of mind
Freedom
Security
Satisfaction
Quality of life
Sense of Community
In control
Mood effect
Done a good job
Less stress
Feel safe
Spend time w/ family/friends
Healthy lifestyle
Provide for others
Do more/other things
Children better quality of life
Stay in community
Better/Improved community
Saves time
Enjoy outdoors/rec
Rural, small town feel
6%
6%
Things get done/Problems solved
Afford housing/ living
Friendly people & neighbors
4%
4%
Children learn more
Neighbors help
Sense of community
Weather
Traffic
Colleges/ adult education
Variety to do
Family friendly/ Strong values
Education system
Income Equality
Convenience/ Easy Living
Traffic
Crime
Infrastructure
Jobs Employment
Cost of living
Taxes
Political/Partisan Agreement
The people/ Small town feel
Pg. 32



Key Findings #5:

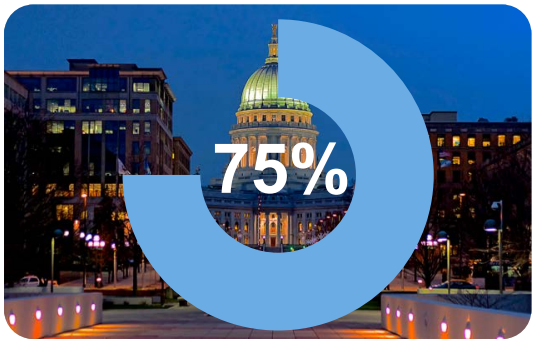
High support for regional visioning focusing on safe neighborhoods, affordable housing, revitalization and reinvestment to reduce crime, and improving base infrastructure.

Pg. 34

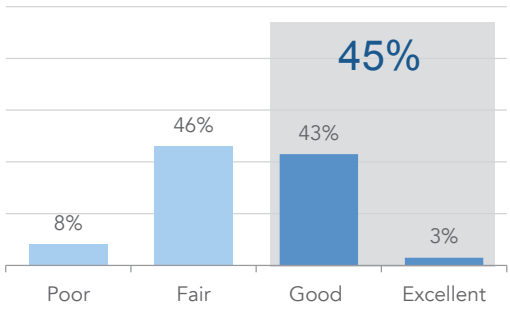
HEART+MIND STRATEGIES

High importance for vision/long range plan

Importance of Having a Vision/Long Range Plan for Growth
Top 2 Box (Extremely/Very Important)



Performance Rating of Greater Madison Region on Planning and Preparing for Growth



Pg. 35

How important is it that this region have a vision or a long range plan to deal with growth and make the quality of life in the region better?
How would you rate the performance of Greater Madison region when it comes to planning and preparing for growth in the region?

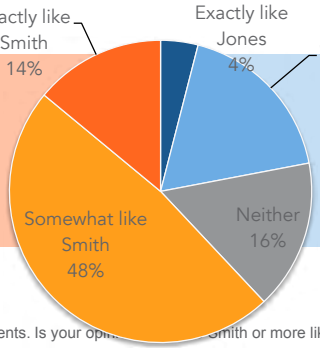
Focus new growth in the urban center, existing cities, villages and urban towns rather than new areas



62%
Smith believes that the region should begin focusing new growth and development in the urban center, existing cities, villages and urban towns, and in parts of the communities that need to be revitalized or redeveloped.

22%
Jones believes that the region should begin focusing new growth and development across the region into new areas and communities where there hasn't been much development before.





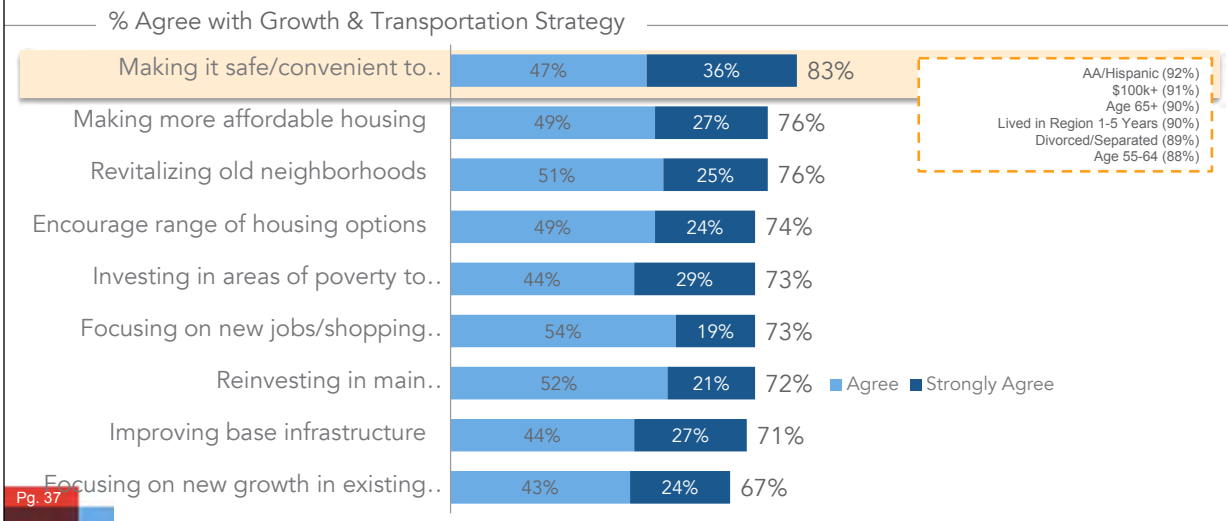
75% Ages 18-24
70% Income $100k+
69% Lived in region 11-15 years
68% Ages 65+
68% Ages 55-64
68% Do not live in the Greater Madison region
68% View economy as 'strong

High school education or less 35%
Ages 35-44 34%
Economy viewed as 'weak' 33%
Lived in region 1-5 years 32%
Influencers 27%
Divorced/Separated 27%

Pg. 36

Below are the opinions of two hypothetical residents. Is your opi… Smith or more like Jones?

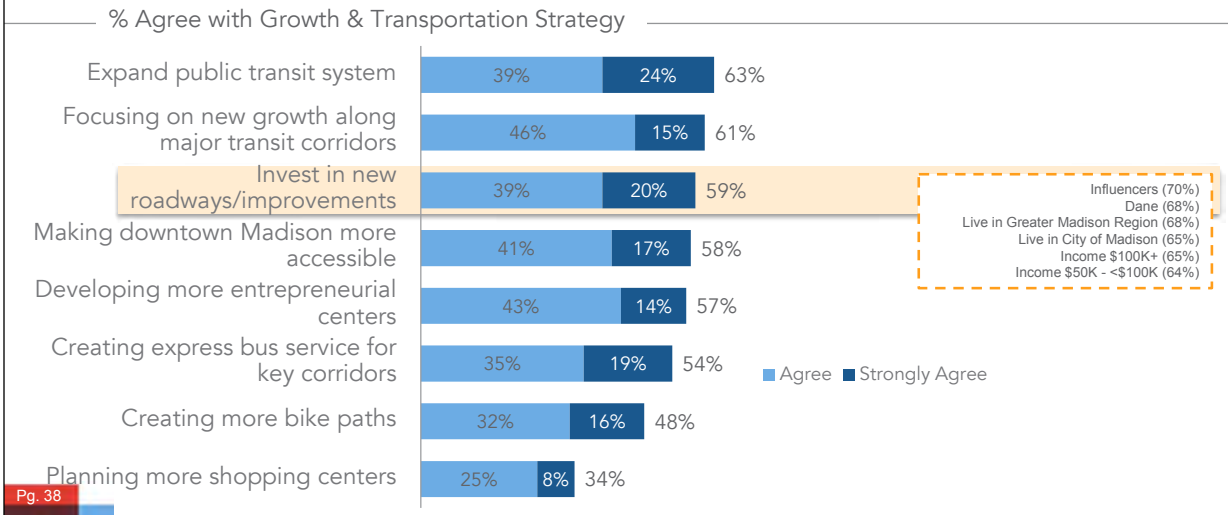
Top growth and transportation strategies



Pg. 37

How much do you agree or disagree with the following growth and transportation strategies to help make sure the region stays vibrant and healthy? Please note that these strategies are not mutually exclusive.

Top growth and transportation strategies (continued)



Pg. 38

How much do you agree or disagree with the following growth and transportation strategies to help make sure the region stays vibrant and healthy? Please note that these strategies are not mutually exclusive.

Key Findings #6:

Strong support for regional transportation investment, particularly increases in road maintenance and improvement/expansion of public transportation.

Pg. 39

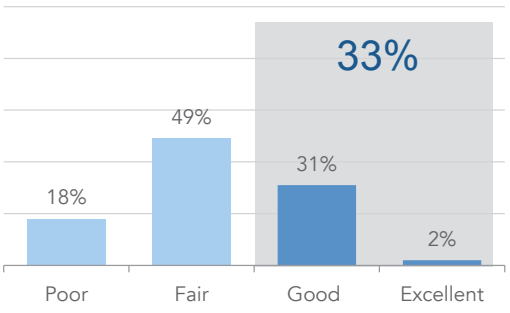
HEART+MIND STRATEGIES

Importance of Transportation Vision/Long Range Plan

Importance of Having a Vision/Long Range Plan for Transportation
Top 2 Box (Extremely/Very Important)



Performance Rating of Greater Madison Region on Planning and Implementing Transportation Solutions

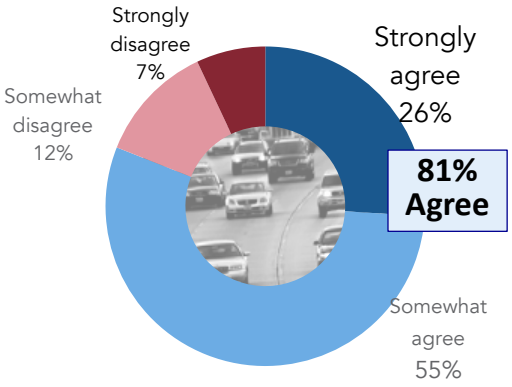


Pg. 40

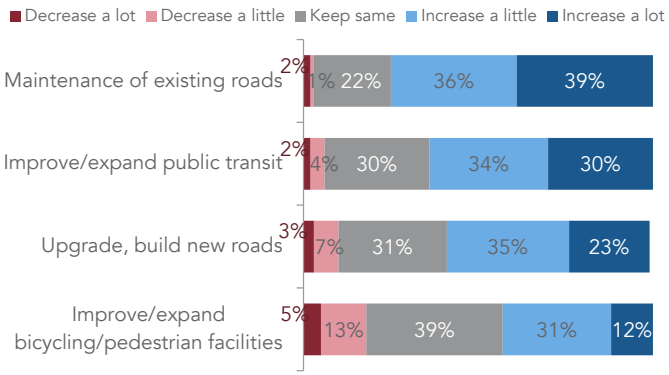
BASE: ALL RESPONDENTS (n=570)
Q615. How important is it that this region have a vision or a long range plan to deal with transportation issues in the region?
Q620. How would you rate the performance of Greater Madison region when it comes to planning and implementing transportation solutions in the region?

Eight in ten believe investment in Greater Madison Region's transportation system is an important priority. Strongest spending support for maintenance of existing roads followed by improved or expanded public transit

"Investing in regional transportation is an important priority for our region"



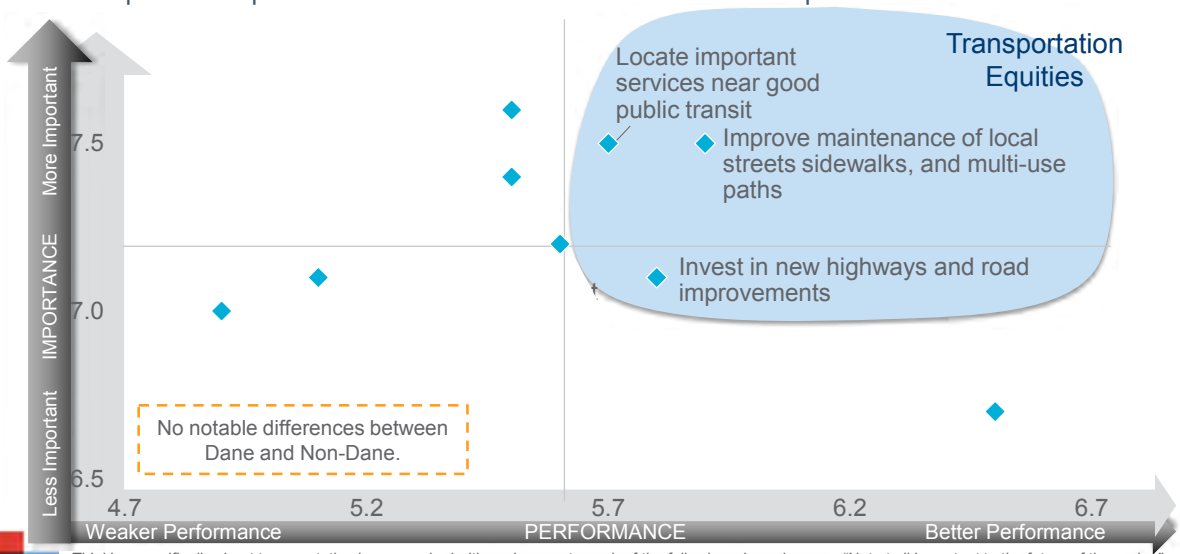
Level of Increase/Decrease for Transportation Investments



Pg. 41

BASE: ALL RESPONDENTS (n=570)
Q700. To what extent do you agree with the statement: Investing in regional transportation is an important priority for our region?
Q705. There are a lot of priorities when it comes to investing in a regional transportation system. For each of the following, please indicate the degree to which investment should be increased or decreased.

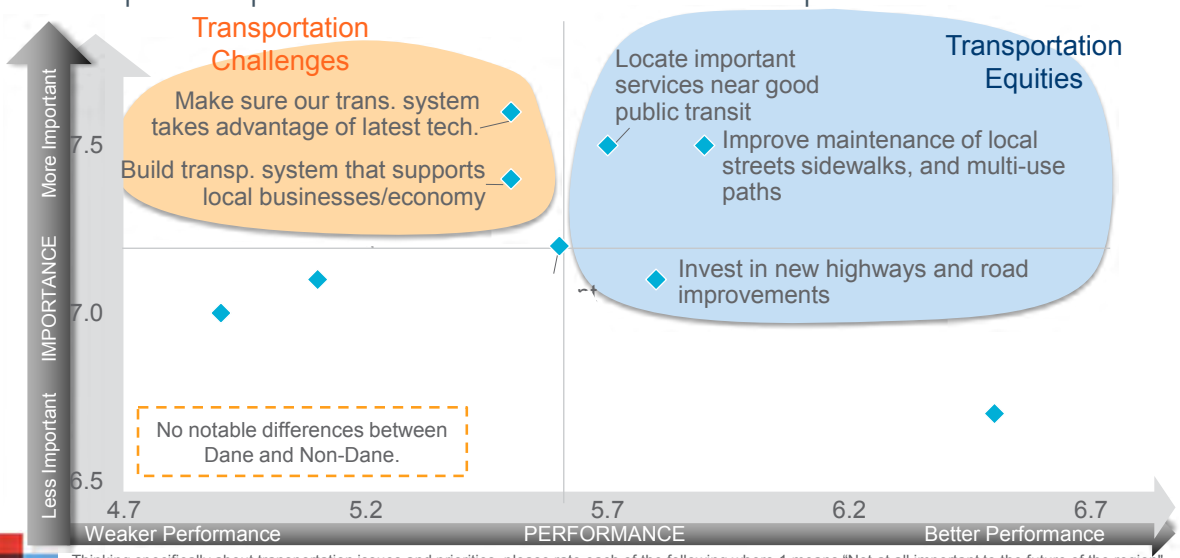
Perceptual Importance and Performance on Transportation Priorities



42

Thinking specifically about transportation issues and priorities, please rate each of the following where 1 means "Not at all important to the future of the region" and 10 means "Extremely important priority for the future of the region":
Please indicate how well you think the Greater Madison Region is performing on each of these priorities using the scale where 1 means "the region is not performing well at all" and 10 means "the region is performing extremely well".

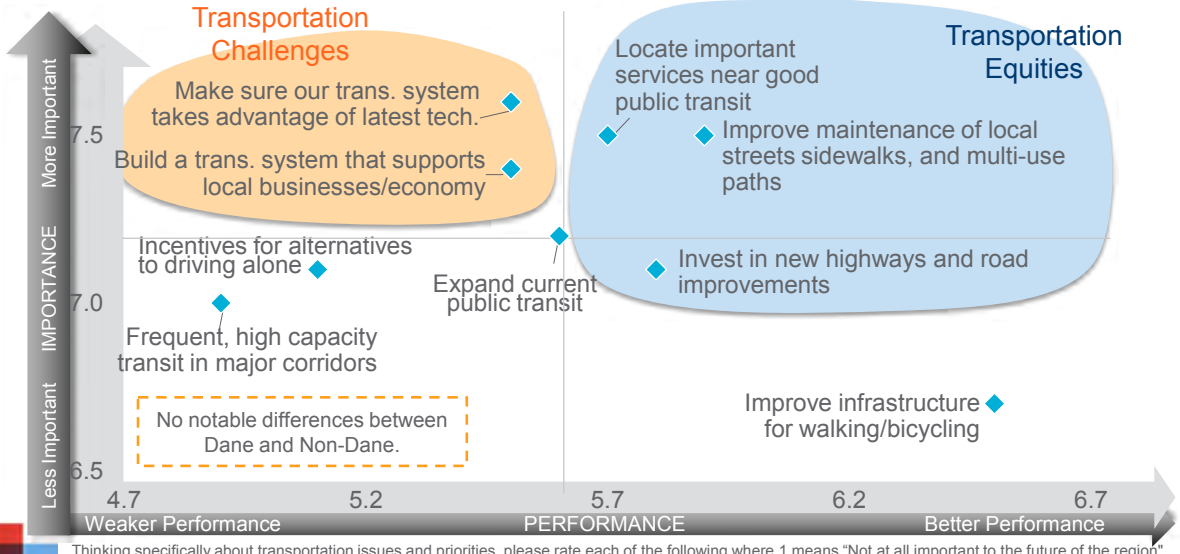
Perceptual Importance and Performance on Transportation Priorities



43

Thinking specifically about transportation issues and priorities, please rate each of the following where 1 means "Not at all important to the future of the region" and 10 means "Extremely important priority for the future of the region":
Please indicate how well you think the Greater Madison Region is performing on each of these priorities using the scale where 1 means "the region is not performing well at all" and 10 means "the region is performing extremely well".

Perceptual Importance and Performance on Transportation Priorities



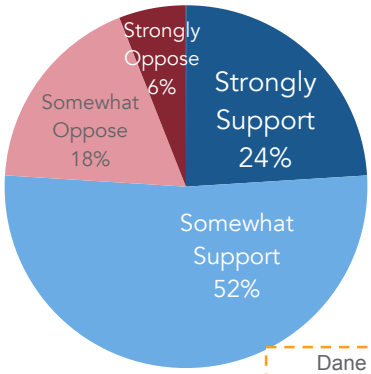
44

Thinking specifically about transportation issues and priorities, please rate each of the following where 1 means "Not at all important to the future of the region" and 10 means "Extremely important priority for the future of the region":
Please indicate how well you think the Greater Madison Region is performing on each of these priorities using the scale where 1 means "the region is not performing well at all" and 10 means "the region is performing extremely well".

More than three-quarters support tax dollars for public transit improvement in their community

Support Using Your Tax Dollars for Public Transit Improvement in Your Community





Dane more supportive of allocation of tax dollars vs. Non-Dane (80% vs. 72%)

Pg. 45

Thinking about just one part of the transportation picture, do you support or oppose the allocation of your local tax dollars toward the expansion and improvement of public transit services in your community?

HEART MIND STRATEGIES a Wirthlin inspired consultancy

Priorities and Values of the Madison Region

Quantitative Study Results

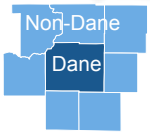
Prepared for A Greater Madison Vision and Madison Area Transp. Planning Board

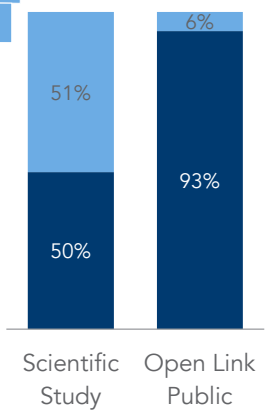
February, 2016



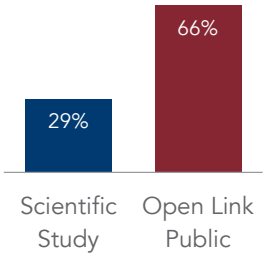
Open Link Public respondents much more likely to reside in Dane county, City of Madison and have lived in region longer

County of Residence





Live in City of Madison



Number of Years Lived in Region

	Scientific Study	Open Link Public
Less than 1 year	4%	1%
1-5 years	17%	10%
6-10 years	13%	13%
11-15 years	9%	11%
Greater than 15 years	57%	64%
Mean	*22.1*	*26.7*

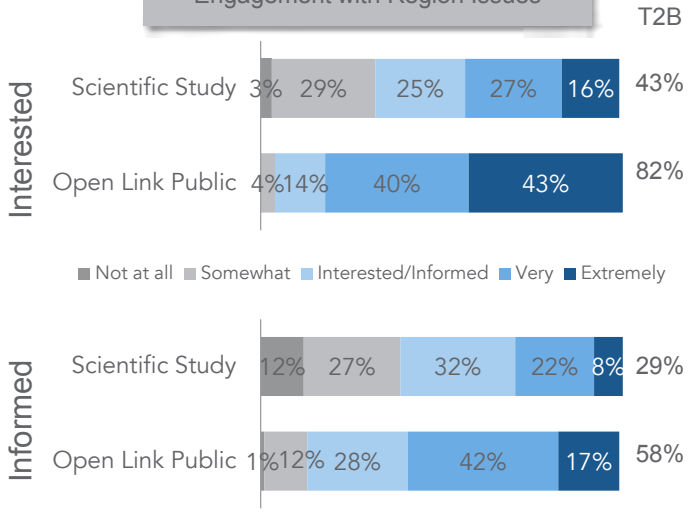
Pg. 47

Open Link Public respondents more likely to be Influencers with far higher interest in and knowledge of regional issues

Education

	Scientific Study	Open Link Public
High School or Less	12%	3%
Some College	30%	14%
College Degree or Higher	57%	83%

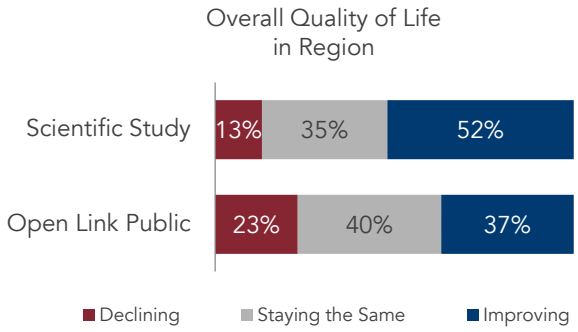
Engagement with Region Issues

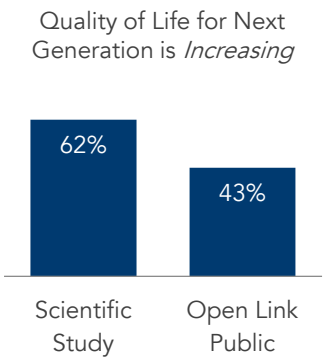


Pg. 48

Open Link Public respondents less optimistic about current and future quality of life than rest of the region

Quality of Life



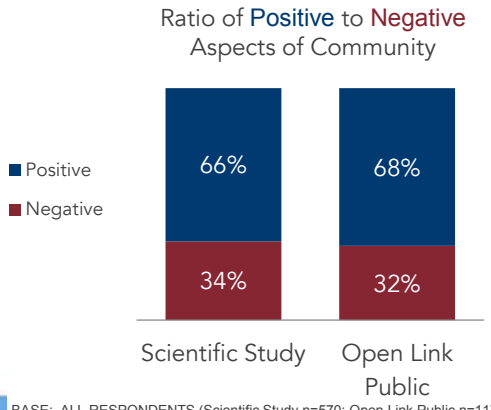


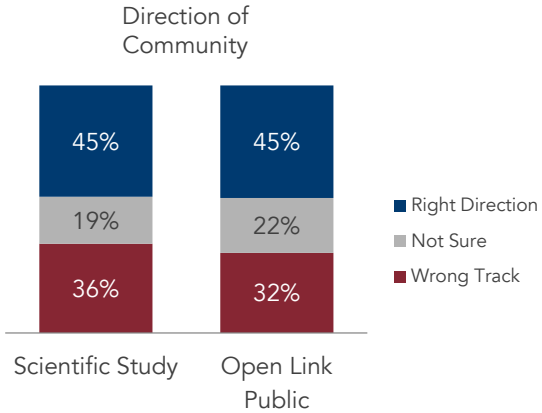
Pg. 49

BASE: ALL RESPONDENTS (Scientific Study n=570; Open Link Public n=1179)
Q300. Thinking about the overall quality of your life here in this region, please imagine a ladder with ten steps representing the "ladder of life." On a scale of 1 to 10, on which step of the ladder do you personally stand at the present time?
Q305. Just as your best guess, on which step will you stand in the future, say about five years from now?
Q310 Thinking about the quality of life that will be here for you or your friends' children and grandchildren, do you see their quality of life in the Greater Madison Region increasing or decreasing in the future?

Scientific Study and Open Link Public respondents align very closely on metrics related to the direction of the community

Direction of Community



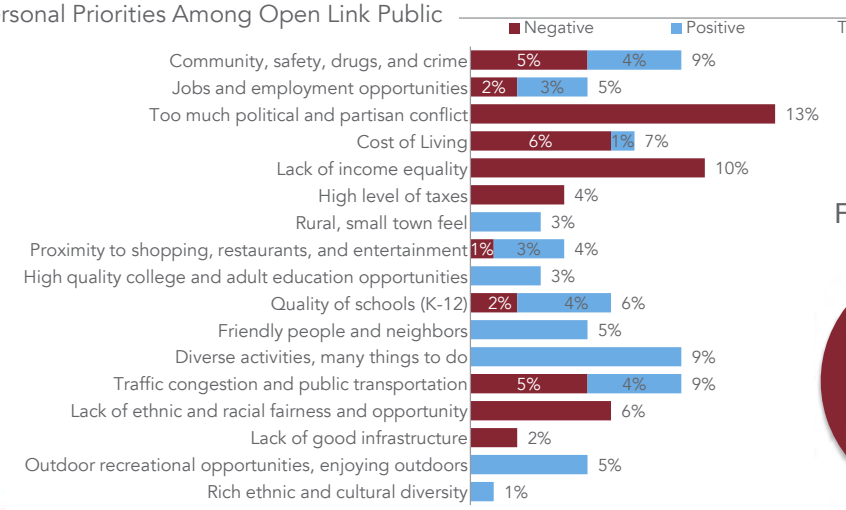


Pg. 50

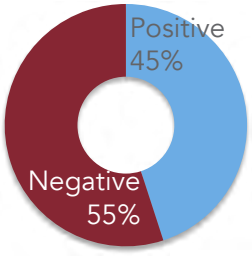
BASE: ALL RESPONDENTS (Scientific Study n=570; Open Link Public n=1179)
Q315. Thinking of all the positive and negative aspects about the quality of life here in the region, what percentage of things would you classify as positive? What percentage is negative?
Q320. On another subject, do you feel things in your own community today are going in the right direction or do you feel things have pretty seriously gotten off on the wrong track?

Open Link Public respondents are less focused on community safety and more focused on diverse activities, traffic congestion and outdoor recreation

Personal Priorities Among Open Link Public



Features Selected



Pg. 51

BASE: ALL OPEN LINK PUBLIC RESPONDENTS (n=1179)
Q400. The people of this region have mentioned many factors—both positive and negative—that contribute to or detract from their quality of life. Thinking about the quality of life in this region, please identify which one (either a positive or a negative factor) of the following factors has the most significant impact on the overall quality of life for you personally. Take your time and be sure to select the one (positive or negative) that has the most significant impact on you personally.

HEART+MIND STRATEGIES

Madison Area T•P•B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

Capital Area Regional Planning Commission

Regional Transportation Plan 2050 Madison Area
Charting Our Course

Regional Values & Priorities Survey

Transportation Questions Summary

Regional Values/Priorities Survey

- Joint CARPC and MPO Survey covering Dane County and parts of surrounding counties
- This transportation question summary analyzes:
  - Unweighted Dane County responses only
  - Responses from the scientific panel, except as noted as being from public sample

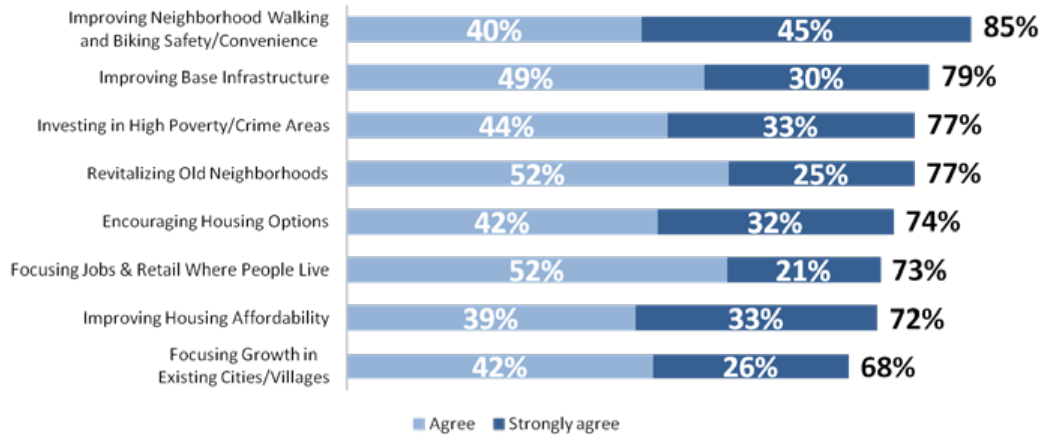


Comparison of Unweighted Public vs. Panel Responses for Dane County

- Greater percent live in City of Madison (66% vs. 57%)
- Older (47% aged 55+ vs. 28%)
- Less racially/ethnically diverse
- Higher income
- More educated
- More informed and interested in quality of life issues

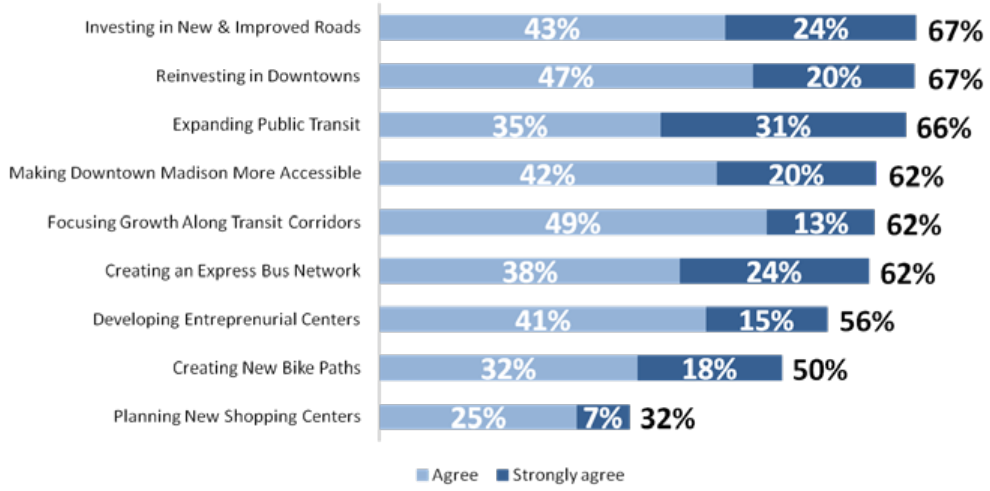


Growth and Transportation Strategies



Charting Our Course

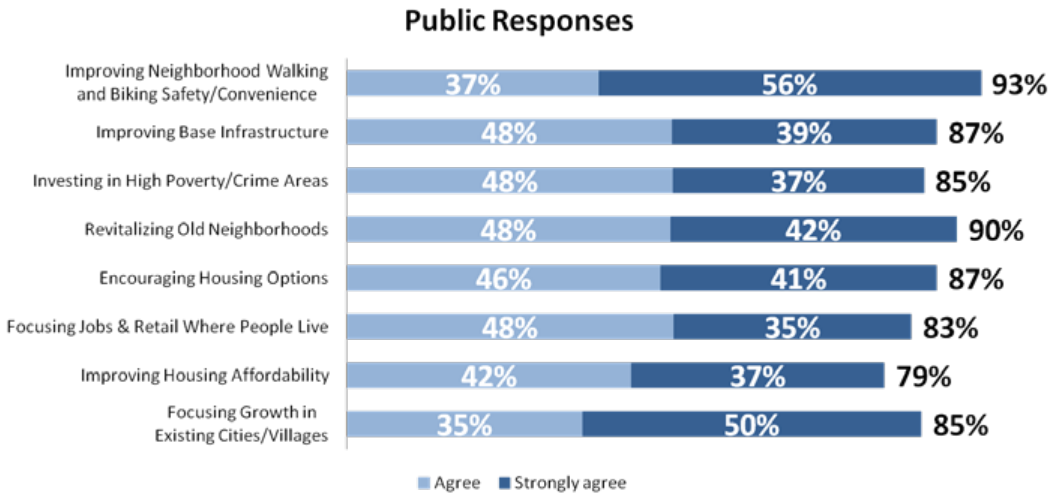
Growth and Transportation Strategies



Minority respondents were more likely to agree with expanding public transit, improving access to affordable housing, and reducing poverty and crime.

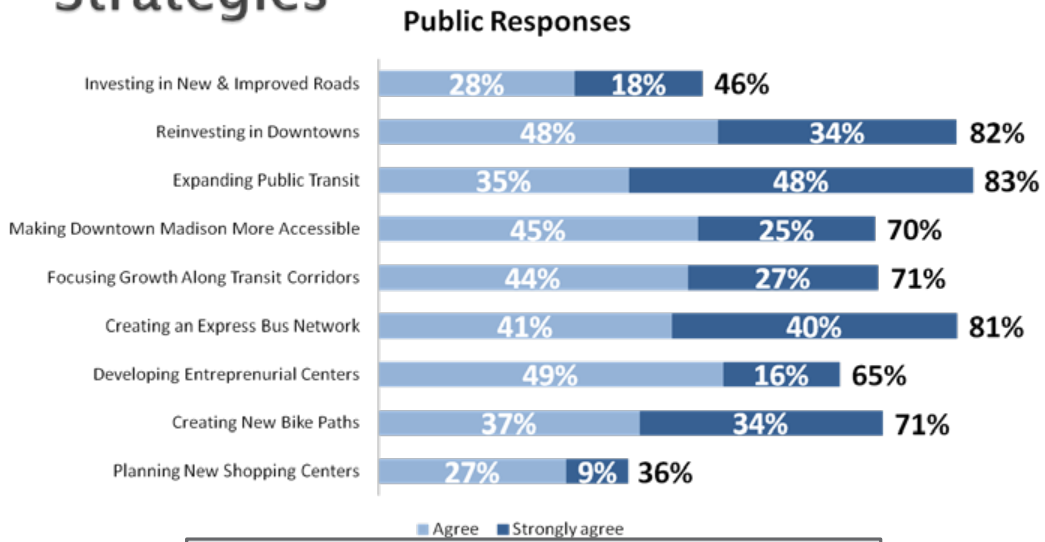
Charting Our Course

Growth and Transportation Strategies



Charting Our Course

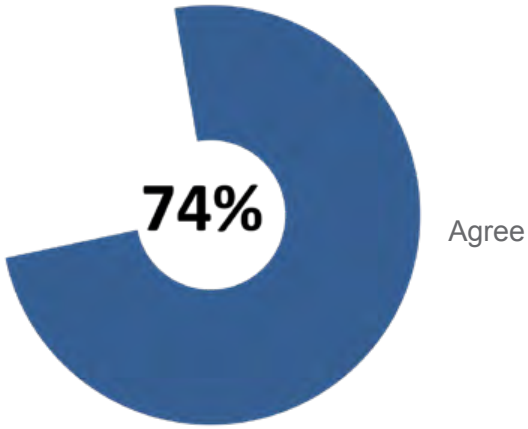
Growth and Transportation Strategies



Public respondents were more likely to agree with reinvesting in downtowns and expanding public transit and bike paths, and less likely to agree with investing in new and improved roads.

Charting Our Course

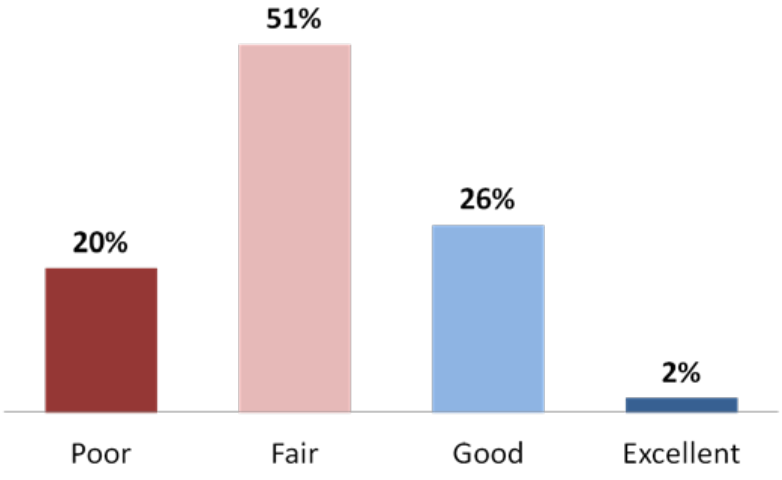
Importance of a Long Range Transportation Plan or Vision



Regional Transportation Plan 2050 Madison Area
Charting Our Course

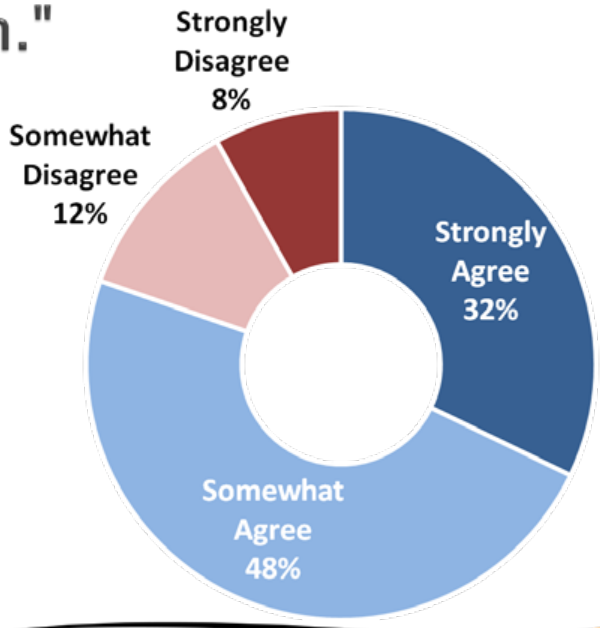
Charting Our Course

Transportation Planning and Implementation Performance



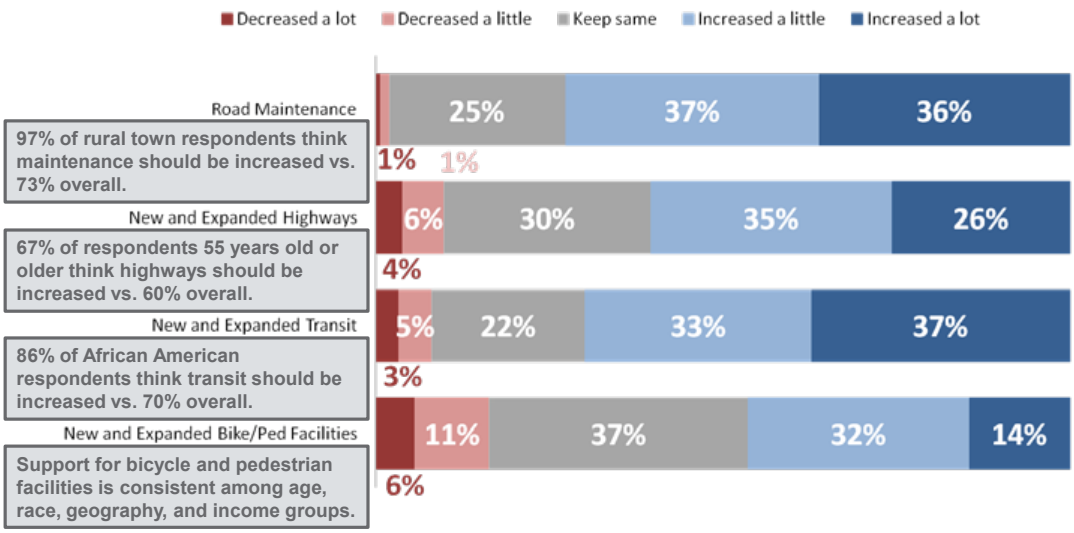
Charting Our Course

"Investing in regional transportation is an important priority for our region."



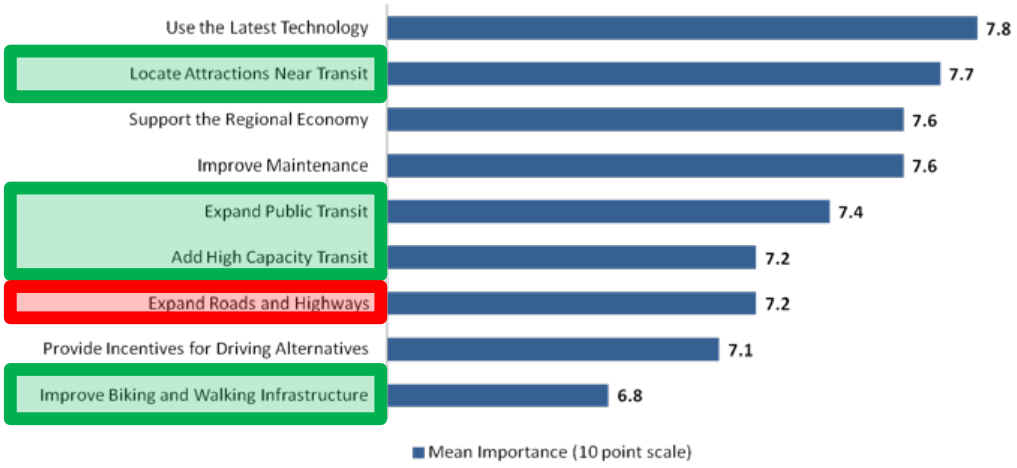
Charting Our Course

Appropriate Level of Transportation Investments



Charting Our Course

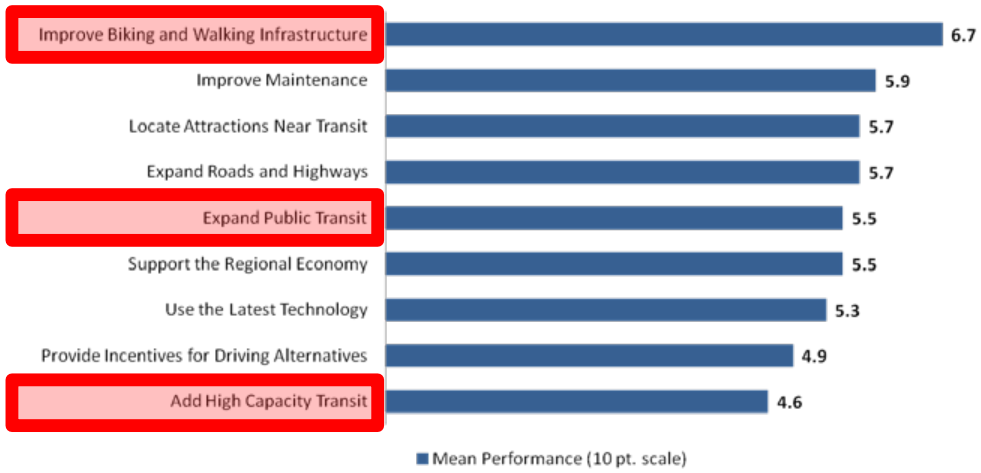
Transportation Priorities



Public respondents placed a higher priority on transit, bicycle, and pedestrian improvements and a lower priority on highway improvements.

Charting Our Course

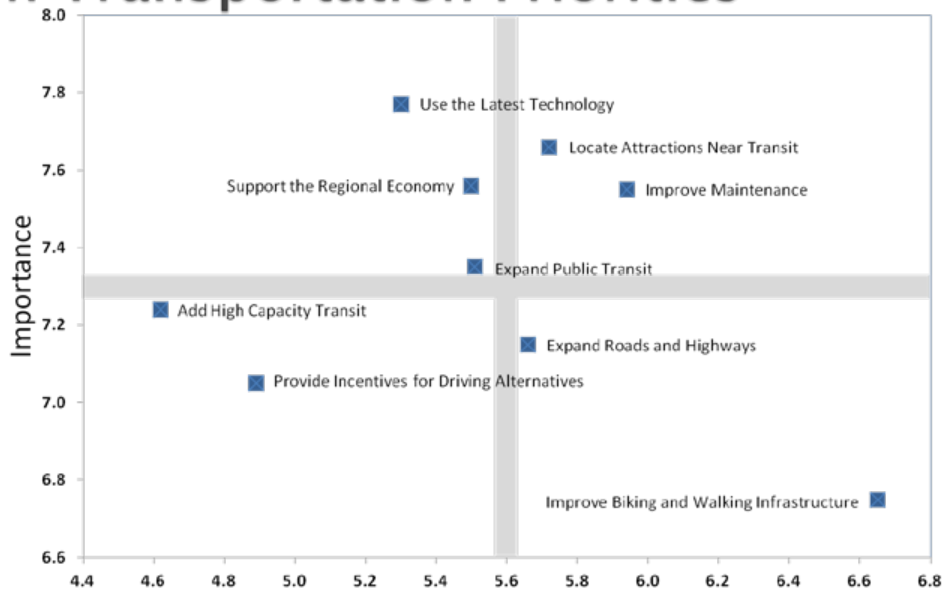
Transportation Performance



Public respondents reported lower performance levels for walking, biking, and transit than the panel respondents.

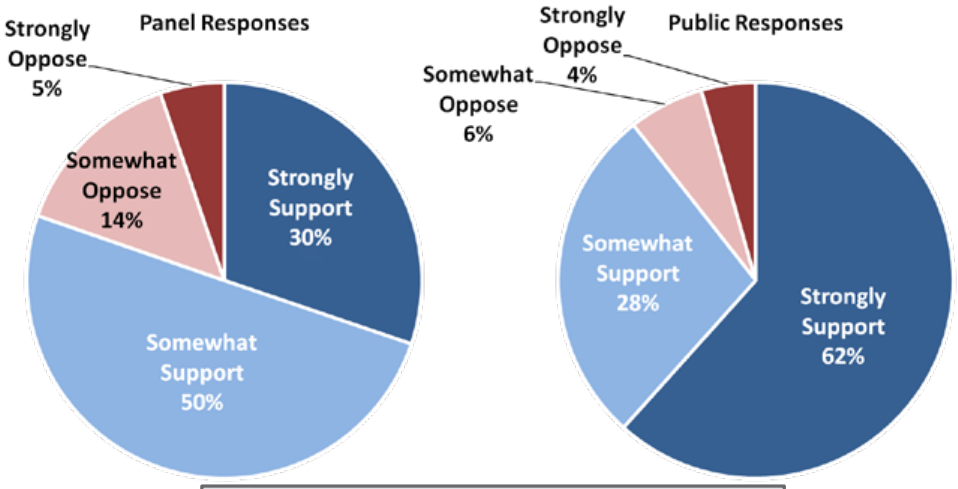
Charting Our Course

Importance and Performance on Transportation Priorities



Charting Our Course

Support for Using Local Taxes for Public Transit Improvements

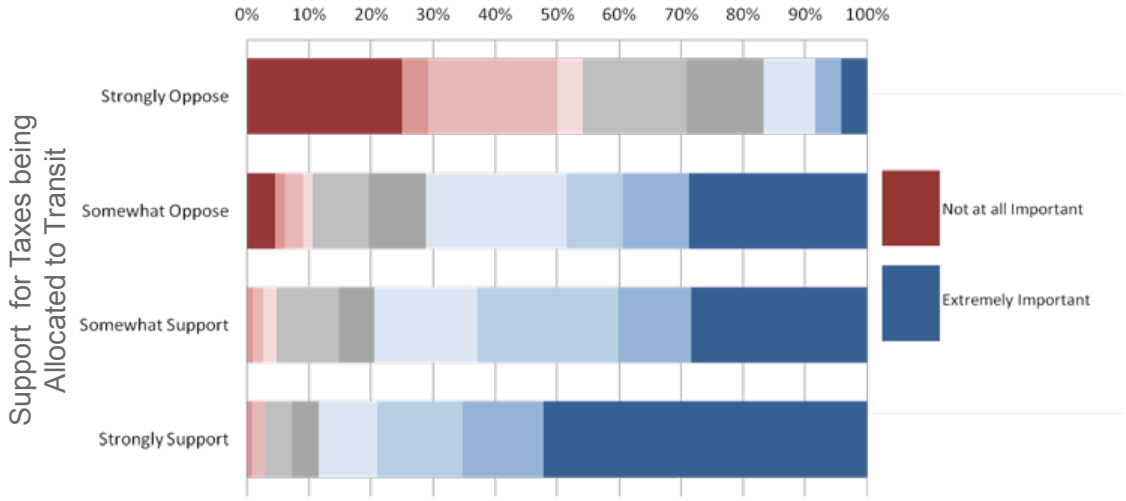


In the public sample, 92% of City of Madison respondents support using taxes for transit improvements vs. 82% outside the City of Madison.

The difference is less stark for panel respondents.

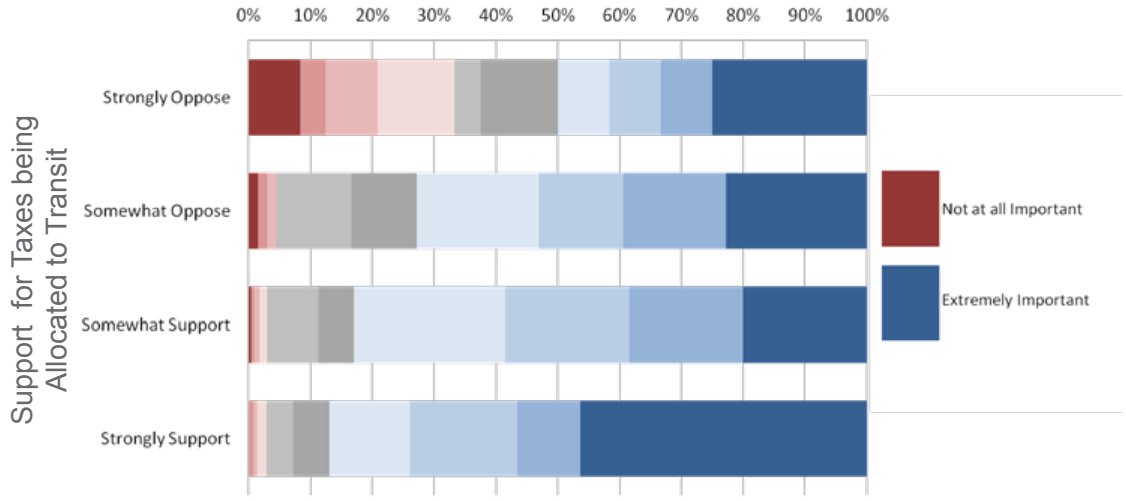
Charting Our Course

Importance of Improving Housing Affordability



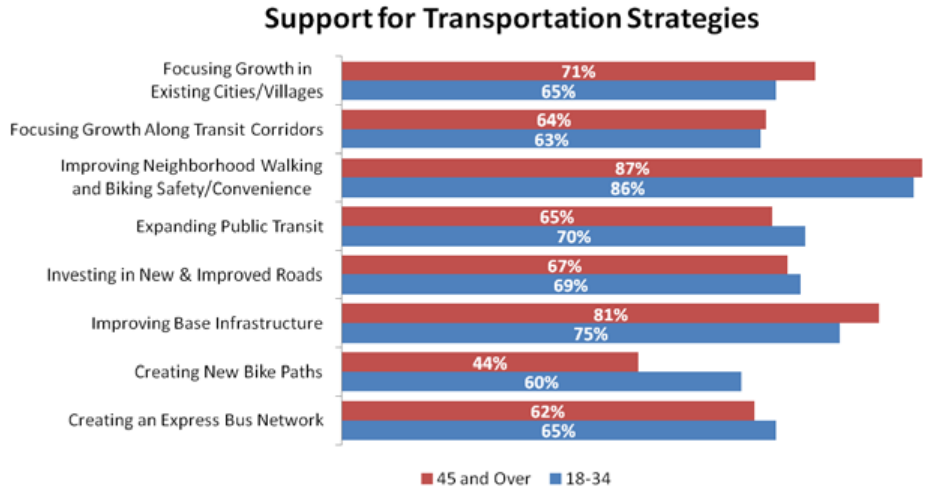
Charting Our Course

Importance of Building a Strong Sense of Community



Charting Our Course

Affect of Age



With the exception of creating new bike paths, different generations are generally in agreement.

Charting Our Course

HEART+MIND STRATEGIES

Madison Area T•P•B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

CAPITAL AREA REGIONAL PLANNING COMMISSION

Regional Transportation Plan 2050 Madison Area
Charting Our Course

Regional Values & Priorities Survey
Transportation Questions Summary

Bill Schaefer
wschaefer@cityofmadison.com

MadisonAreaMPO.org

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Regional Transportation Plan 2050

Kick Off Meetings
March 2, 3, and 7, 2016

RTP 2050 Kickoff Meetings

- Welcome
- Introductions
  - MPO Staff
  - MPO Policy Board Members
  - Other Elected Officials

Charting Our Course

Outline

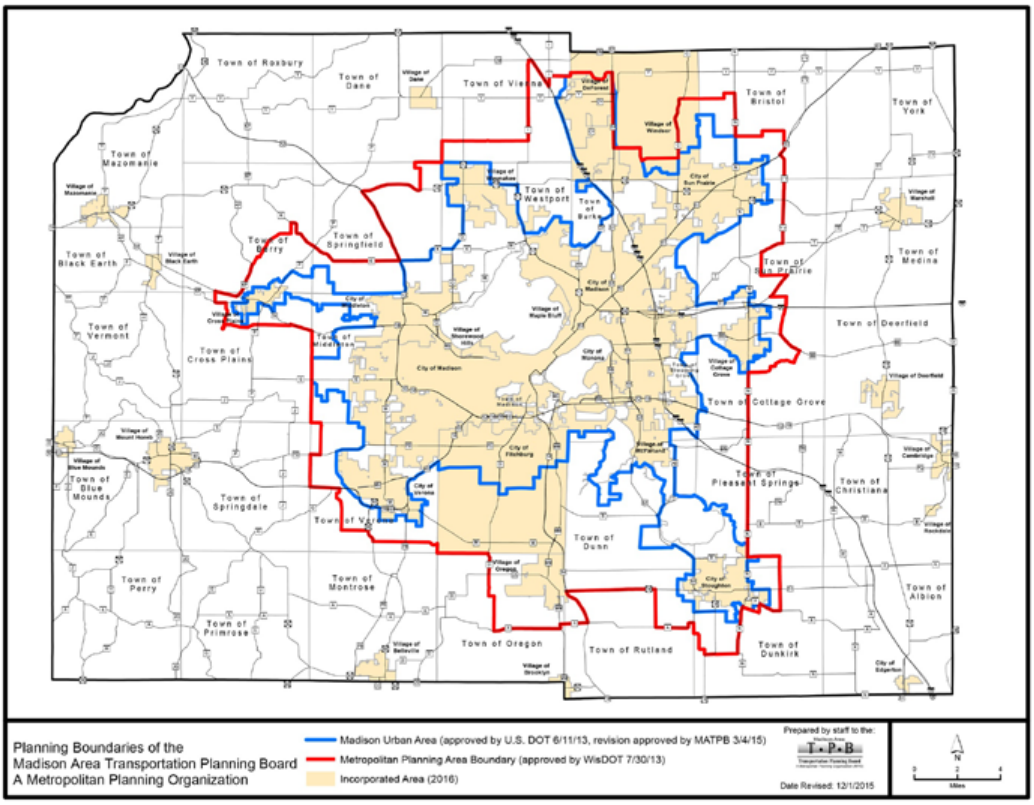
- Brief Overview of the Madison Area Transportation Planning Board (MPO)
- Brief Overview of Regional Transportation Planning Process and MPO's Role
- What is a Regional Transportation Plan?
- Regional Transportation Plan Process and Schedule
  - Growth Forecasts
  - Regional Values/Priorities Survey
- Small Group Discussion Exercise



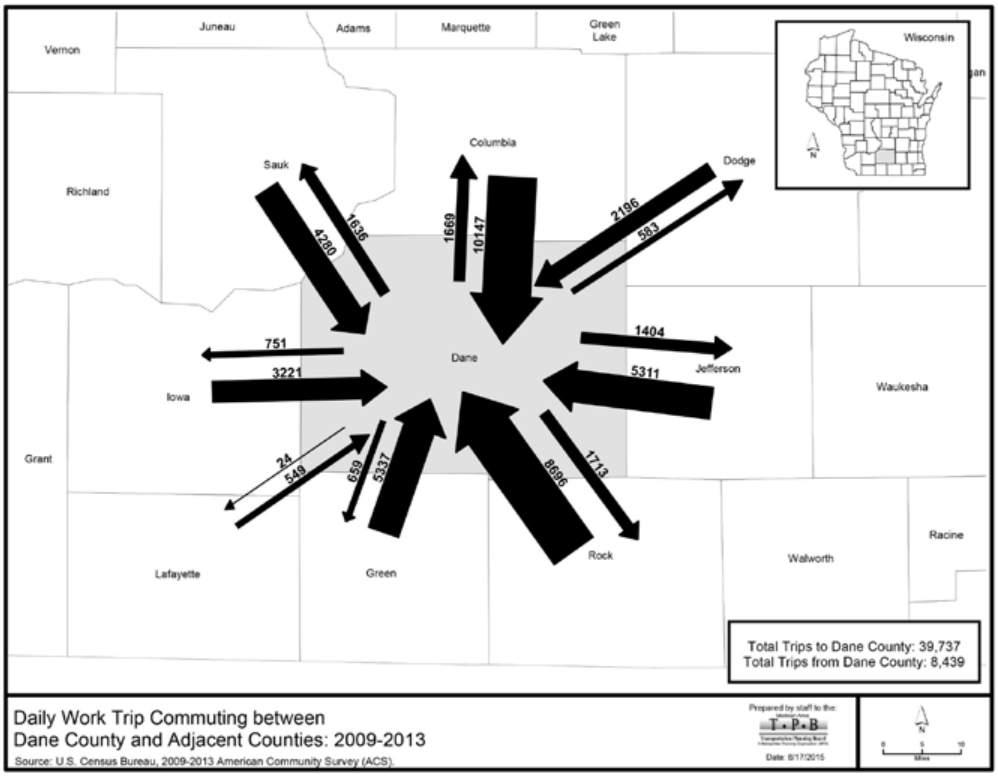
Madison Area Transportation Planning Board (MATPB)

- Policy Body responsible for cooperative regional transportation planning and decision-making
- Governance Structure – 14 member policy board
  - 6 appointed by City of Madison Mayor
    - One must be a transit (Metro) representative
  - 3 appointed by other cities/villages in MPO area
  - 3 appointed by Dane County Executive
  - 1 appointed by towns in MPO area
  - 1 appointed to represent WisDOT





Inter-county Commuting



Regional Transportation Planning Process

- Guides transportation investments and strategies to meet the mobility needs of people and freight
- BUT it is about more than just transportation, which affects many regional issues: patterns of growth, economy, social equity, neighborhood vitality, etc.
- Cooperative, public decision-making process
  - No single agency has responsibility for entire transportation system



Regional Transportation Planning Process

Who is involved in the Madison Area?

- MATPB (MPO)
  - Policy Board
  - Staff
  - Technical Advisory Committees
  - Citizen Advisory Committee
- Wisconsin Department of Transportation
- Metro Transit
- Dane County and Local Jurisdictions
- Other Transportation Providers (Passenger, Freight)
- Interested Parties and General Public



Regional Transportation Planning Process

MPO's Role

- Establish forum to build regional agreement on transportation investments
- Evaluate alternative transportation improvement options and recommend projects and studies
- Recommend land use/transportation policies and strategies
- Coordinate planning of projects between various levels of government
- Approve programming of federal funds for projects and operations through the Transp. Improvement Program
  - MPO does not implement transportation projects



What is the Regional Transportation Plan?

- Overall guide for future improvements and maintenance of the regional transportation system
  - Official plan for federal/state funding purposes
- Integrates plans for the different transportation modes
- Identifies transportation projects, studies, and strategies/ actions to be implemented by WisDOT, MPO, local jurisdictions



What is the Regional Transportation Plan?

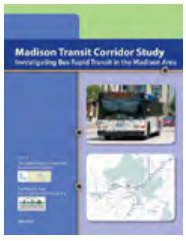
- Based upon, designed to support the regional land use policy plan and local comprehensive plans
- Long range plan (30+ years), but updated every 5 years
- Financially constrained plan
- Refined through mode specific, corridor, and other plans and studies
- Specific major project recommendations come out of these plans and studies

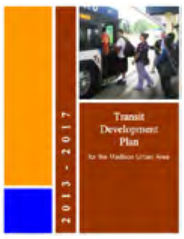
Charting Our Course

Recent and Ongoing Corridor, Mode Specific and Strategic Plans

MATPB (MPO)









Charting Our Course

Recent and Ongoing Corridor, Mode Specific, and Other Plans

WisDOT











- Other Studies and Plans
  - STH 19 (USH 12 to Waterloo) Corridor Management Study
  - State Freight Plan
  - State Highway Investment Plan

Charting Our Course

Desired Outcomes of the Planning Process

- Get people where they need to go, when they need to get there, safely, reliably and affordably
- Improve travel choices
- Improve how the transportation system works
- Improve quality of life and the environment
- Align financial resources to meet greatest needs
  - MPO approves around $60 million in Federal transp. funding per year

Charting Our Course

Regional Transportation Plan Process and Schedule

PLAN DEVELOPMENT STEPS

Collect Data, Analyze Existing Conditions	Prepare Growth Forecasts	Develop Goals and Policy Objectives	Develop Improvement Projects and Strategies (Capital, Operations, Land Use Policy)	Evaluation and Prioritization of Projects and Strategies	Financial Capacity Analysis	Draft Transportation Plan
	Fall/Winter 2015 - 2016		*Spring/Summer/Fall 2016*		*Fall/Winter 2016 - 2017*	

FINAL TRANSPORTATION PLAN
March 2017

PUBLIC ENGAGEMENT

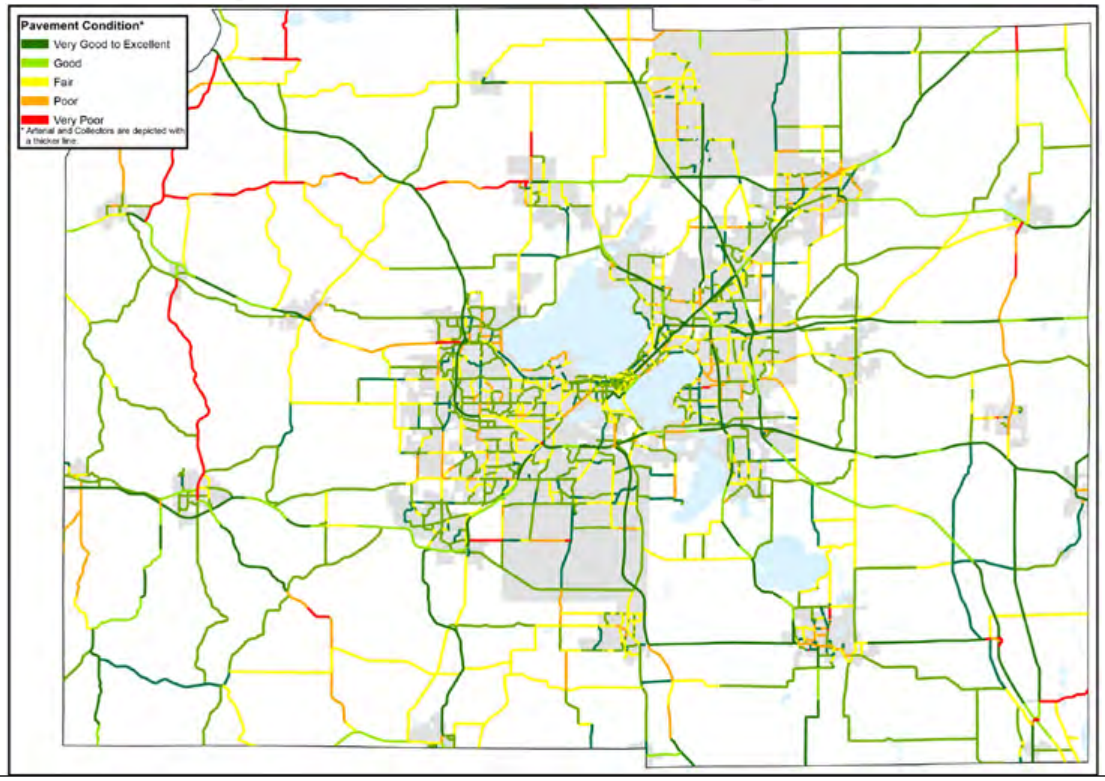
Regional Values/Priorities Survey	Public Information Meeting Series 1 March 2016	Online Survey and Mapping Tools	Public Information Meeting Series 2 September 2016	Online Transportation Budgeting Tool	Public Information Meeting Series 3 January 2017

RTP Website and Social Media updates

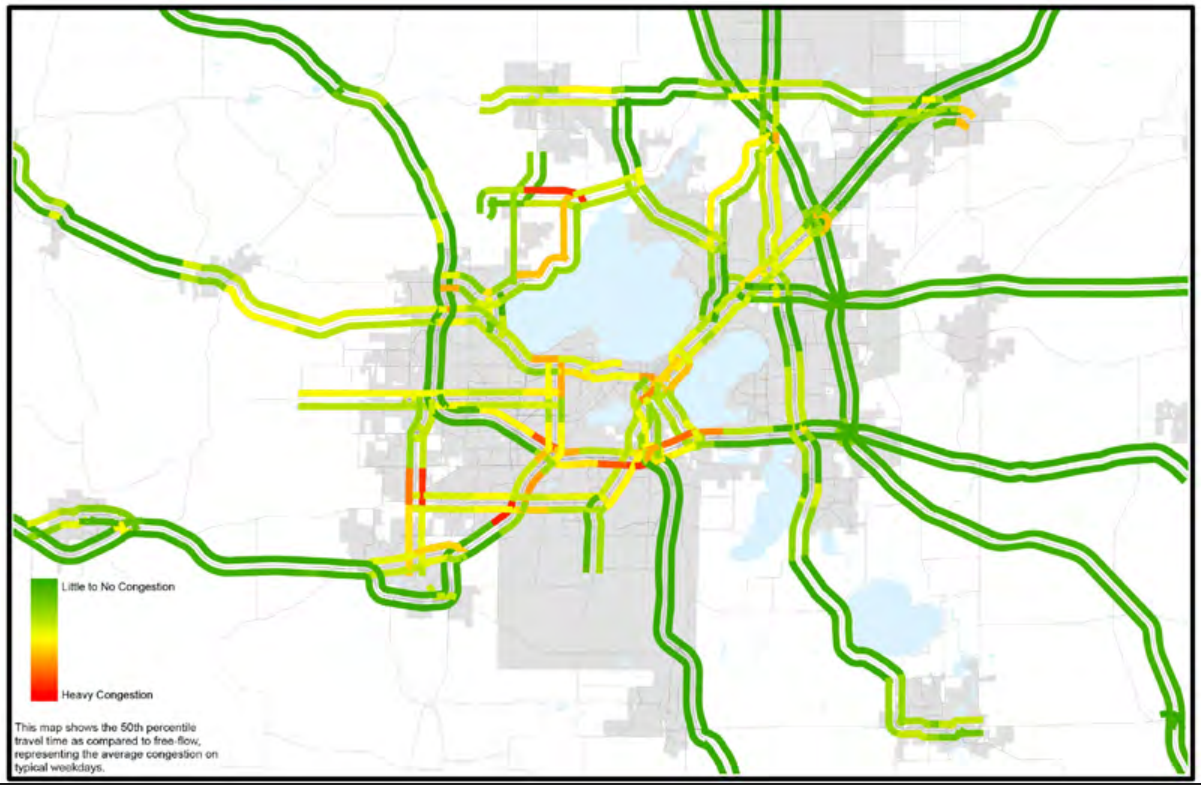
RTP Committee, MPO Board, and MPO Advisory Committee Meetings

Charting Our Course

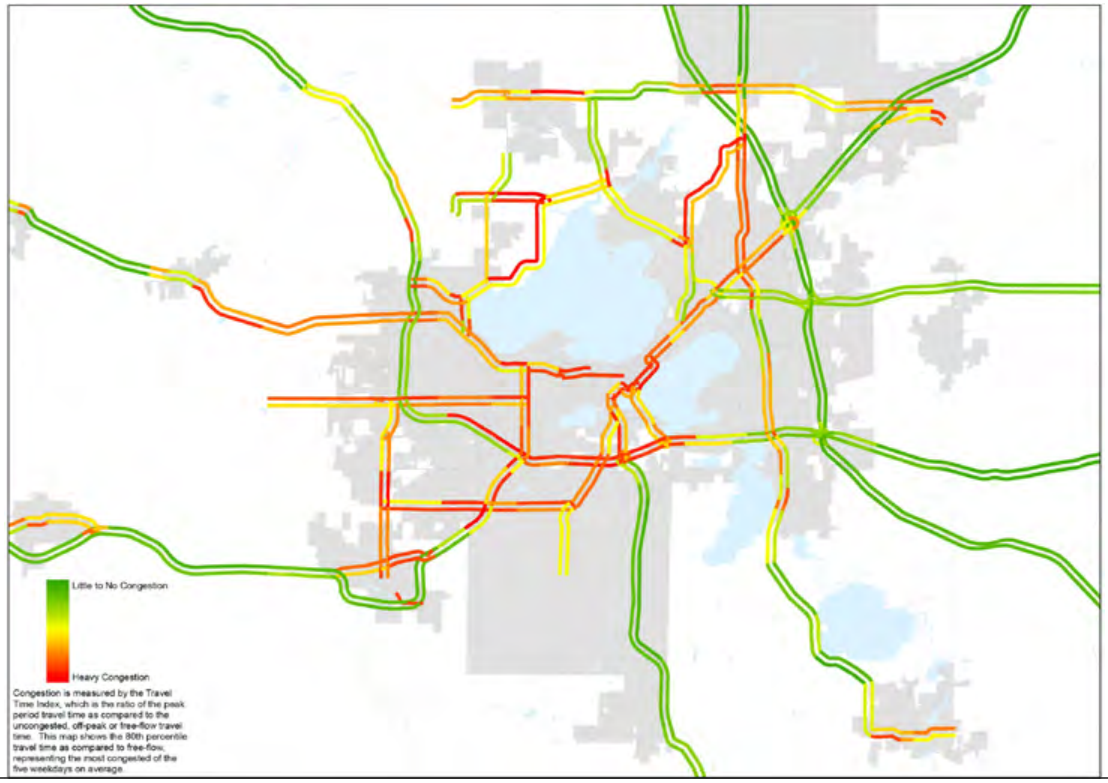
Roadway Pavement Ratings



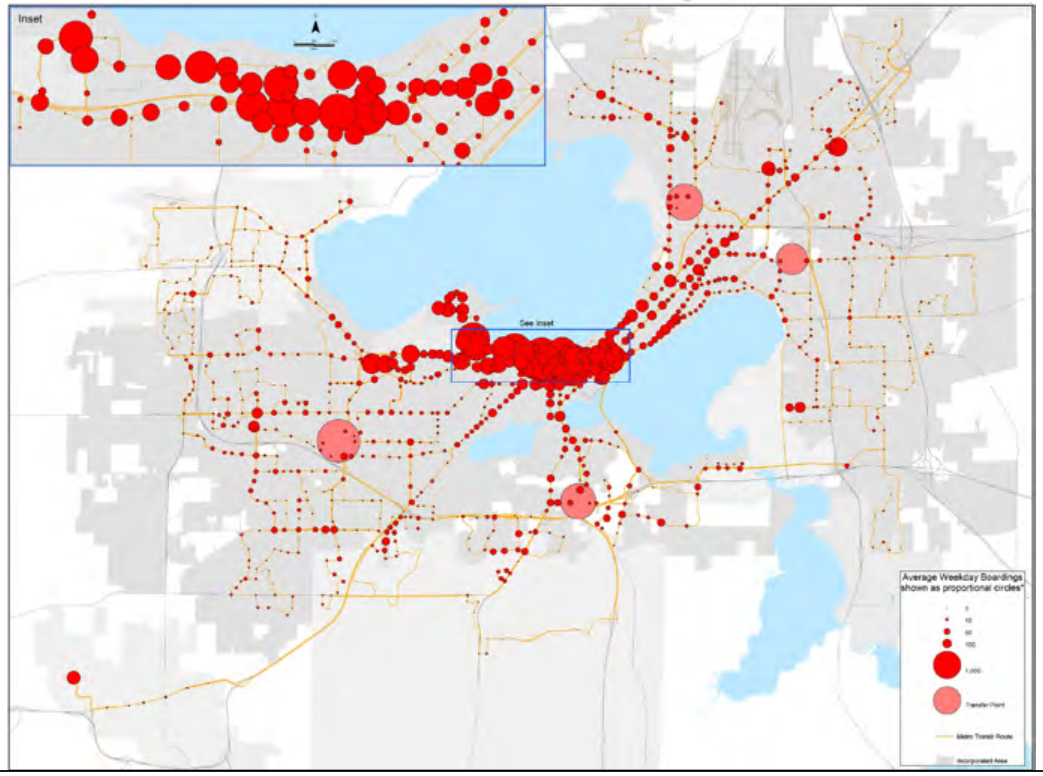
Congestion – Average Day of the Week



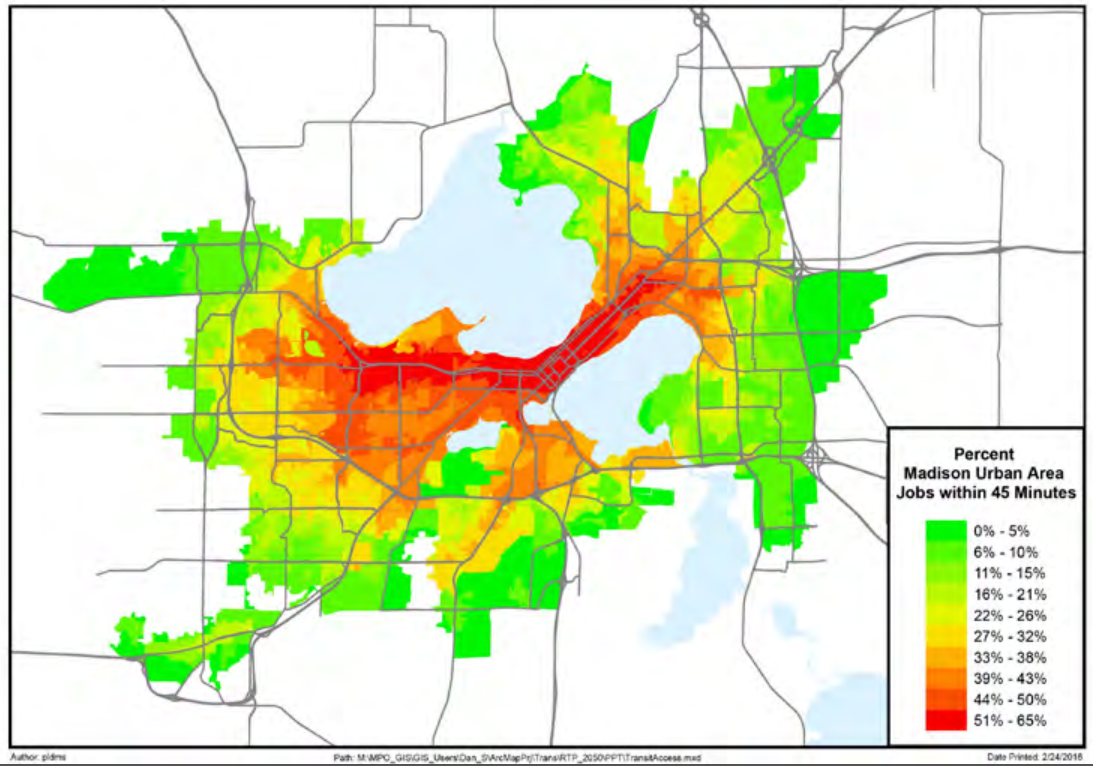
Congestion – Worst Day of the Week



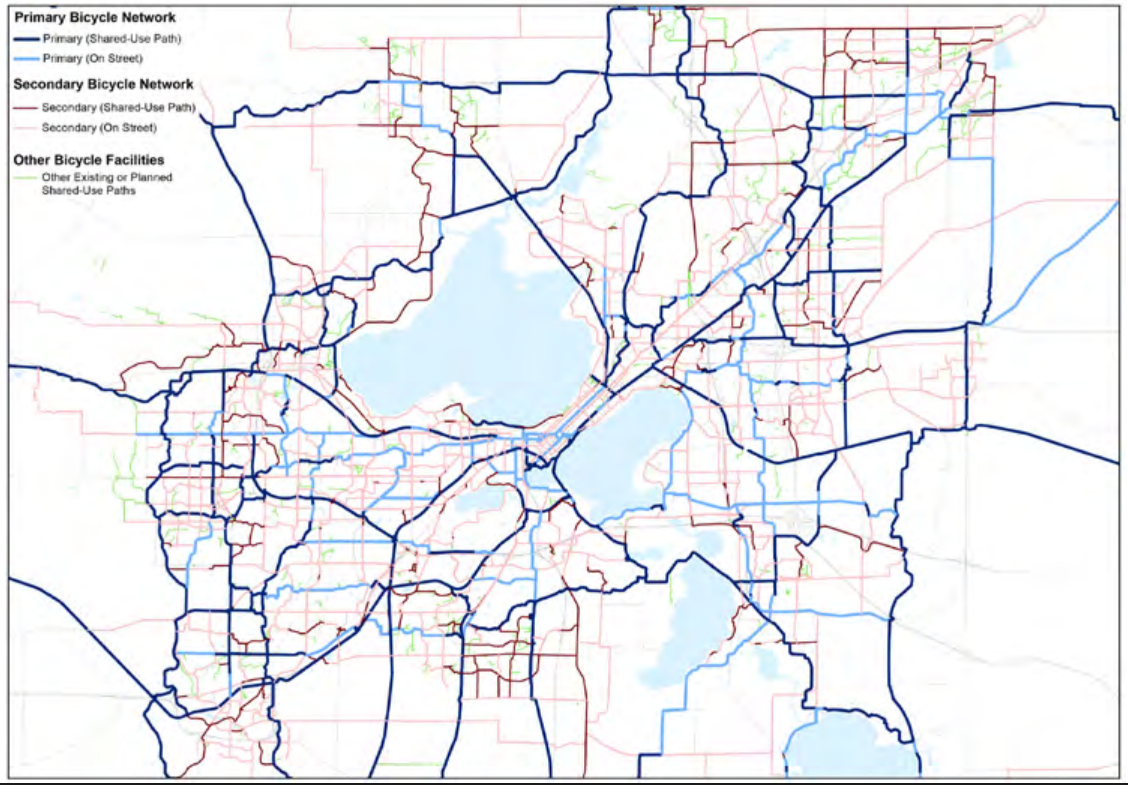
Metro Tranist Ridership



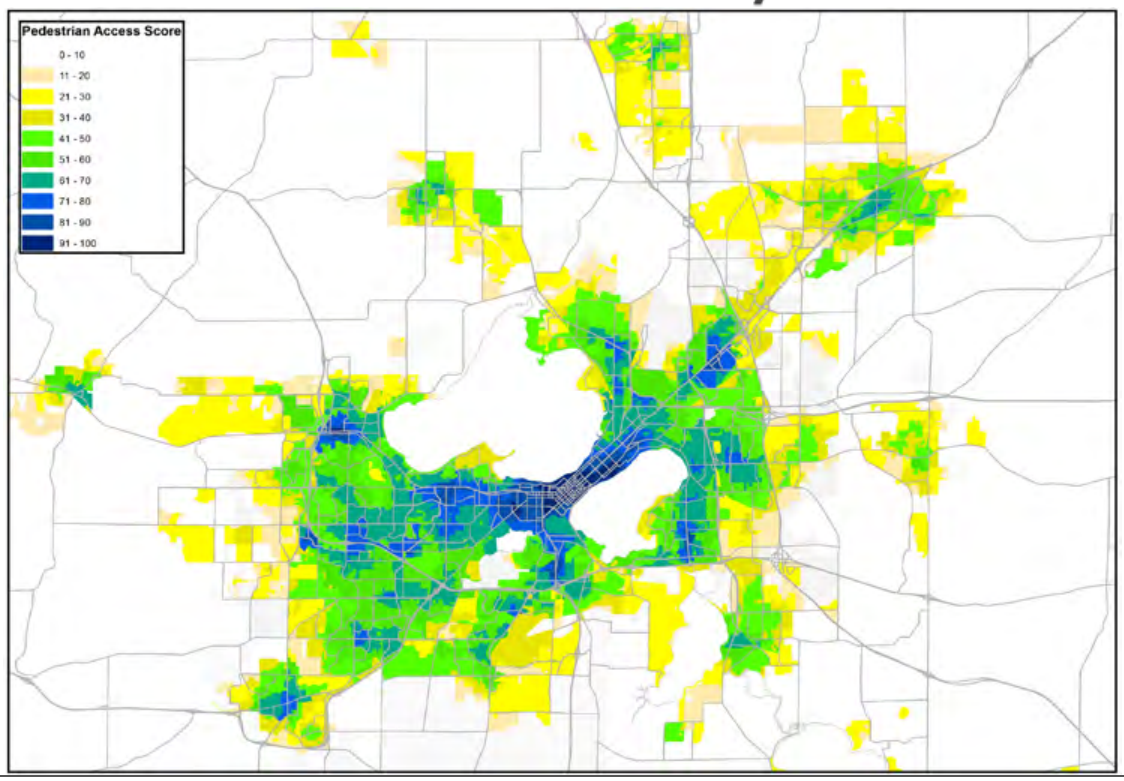
Transit Access to Jobs



Planned Bicycle Route Network



Pedestrian Accessibility



Regional Transportation Plan Process and Schedule

PLAN DEVELOPMENT STEPS

Collect Data, Analyze Existing Conditions	Prepare Growth Forecasts	Develop Goals and Policy Objectives	Develop Improvement Projects and Strategies (Capital, Operations, Land Use Policy)	Evaluation and Prioritization of Projects and Strategies	Financial Capacity Analysis	Draft Transportation Plan
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FINAL TRANSPORTATION PLAN
March 2017

PUBLIC ENGAGEMENT

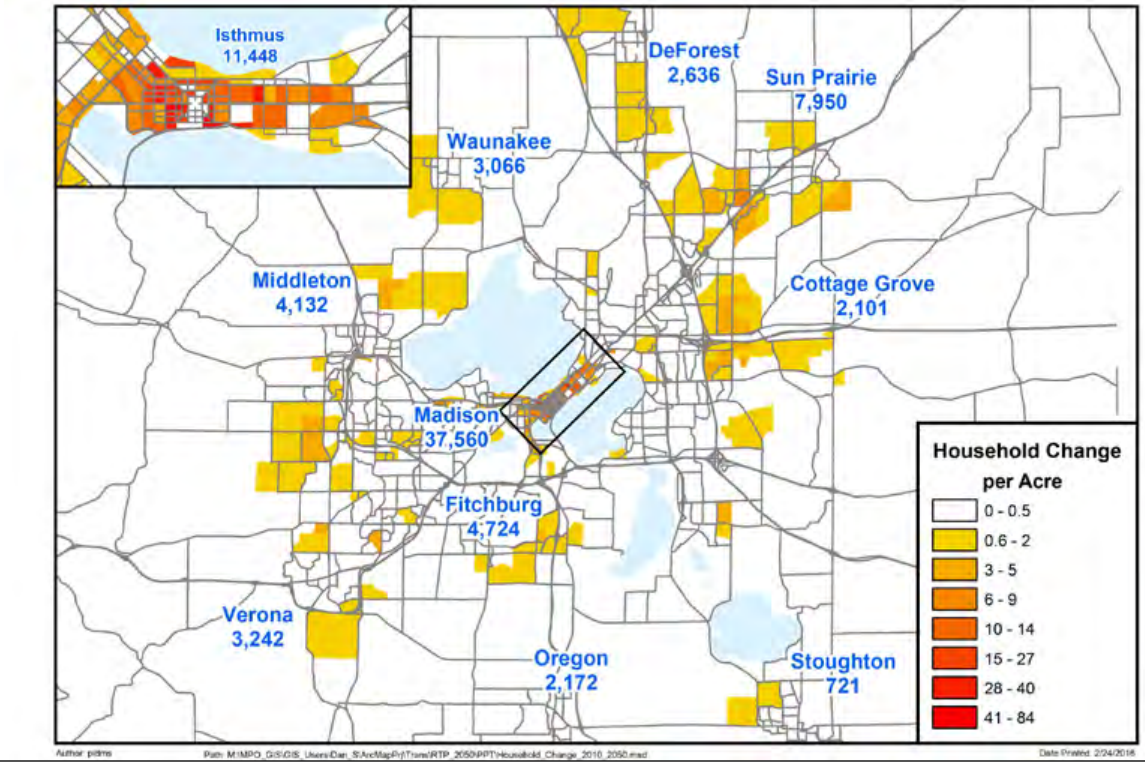
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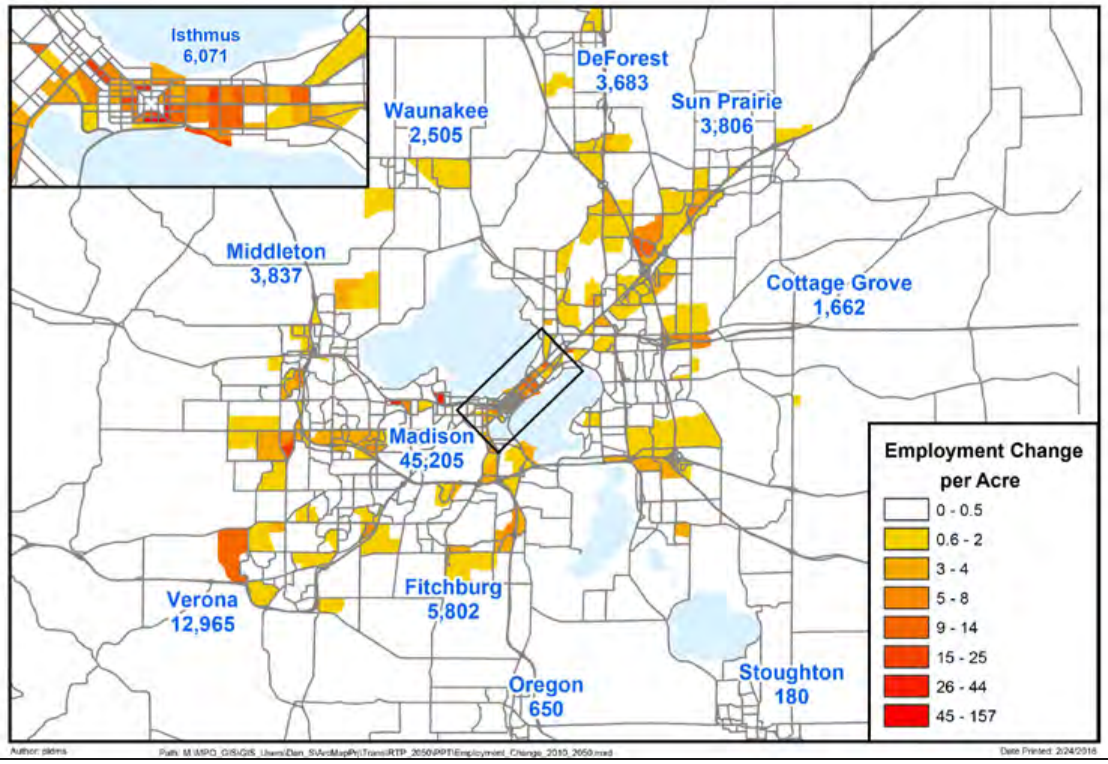
RTP Committee, MPO Board, and MPO Advisory Committee Meetings

Charting Our Course

2010 – 2050 Household Change



2010 – 2050 Employment Change



Regional Transportation Plan Process and Schedule

PLAN DEVELOPMENT STEPS

- Collect Data, Analyze Existing Conditions
- Prepare Growth Forecasts
- Develop Goals and Policy Objectives
- Develop Improvement Projects and Strategies (Capital, Operations, Land Use Policy)
- Evaluation and Prioritization of Projects and Strategies
- Financial Capacity Analysis
- Draft Transportation Plan

Fall/Winter 2015 - 2016 | *Spring/Summer/Fall 2016* | *Fall/Winter 2016 - 2017*

PUBLIC ENGAGEMENT

- Regional Values/Priorities Survey
- Public Information Meeting Series 1 March 2016
- Online Survey and Mapping Tools
- Public Information Meeting Series 2 September 2016
- Online Transportation Budgeting Tool
- Public Information Meeting Series 3 January 2017

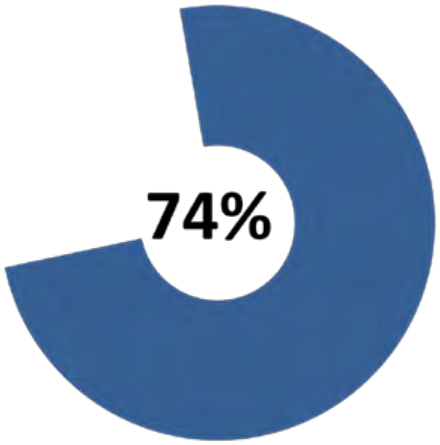
RTP Website and Social Media updates

RTP Committee, MPO Board, and MPO Advisory Committee Meetings

FINAL TRANSPORTATION PLAN *March 2017*

Charting Our Course

Importance of a Long Range Transportation Plan or Vision



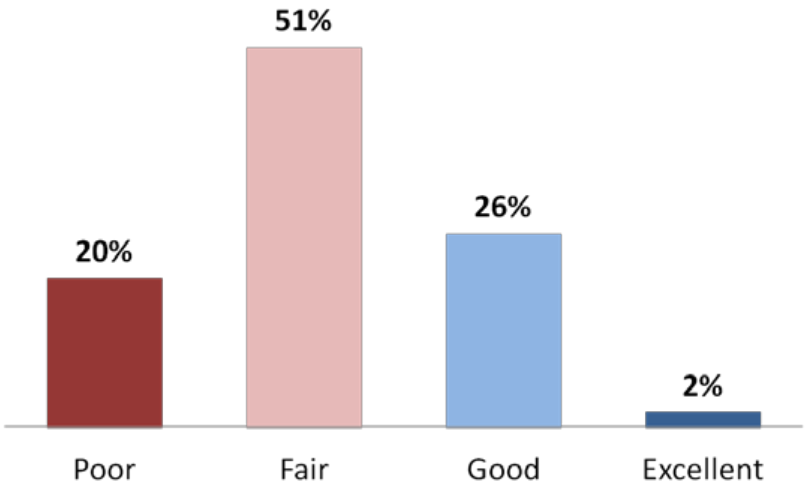
Agree

Regional Transportation Plan 2050 Madison Area

Charting Our Course

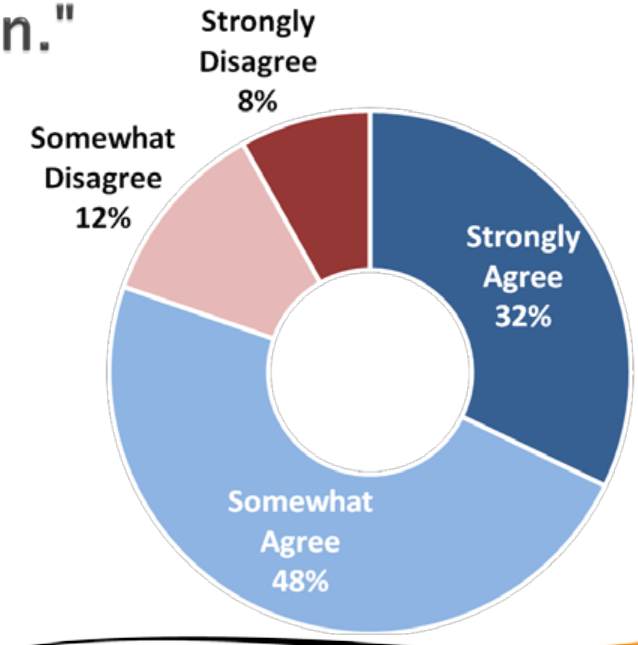
Charting Our Course

Transportation Planning and Implementation Performance



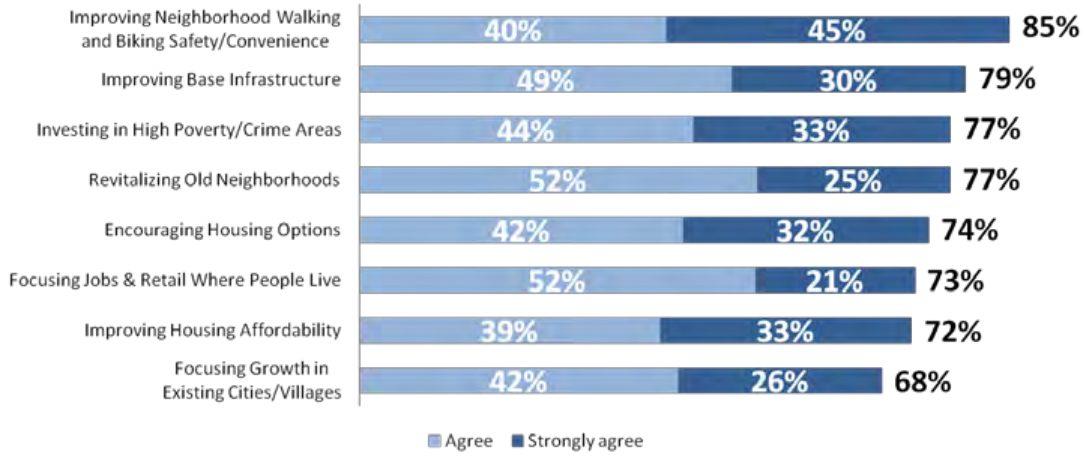
Charting Our Course

"Investing in regional transportation is an important priority for our region."



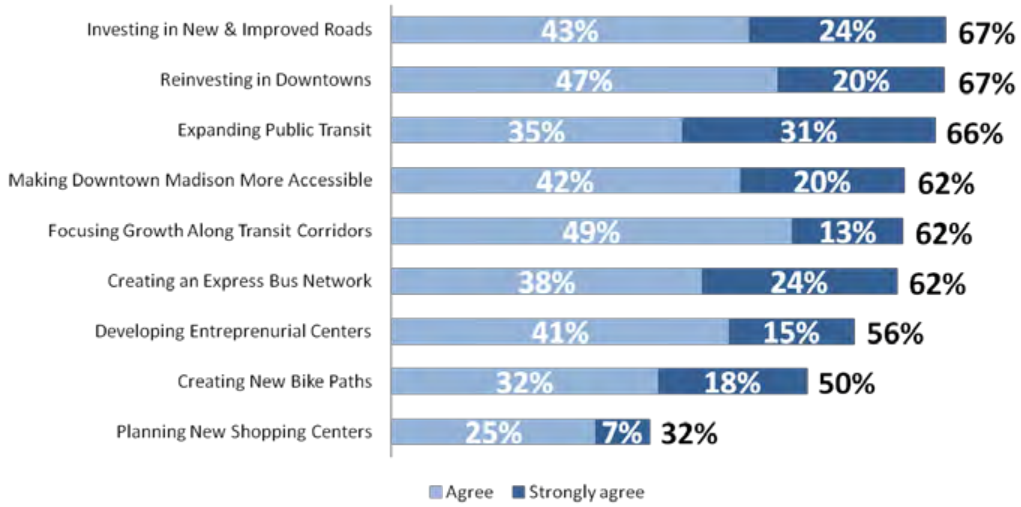
Charting Our Course

Growth and Transportation Strategies



Charting Our Course

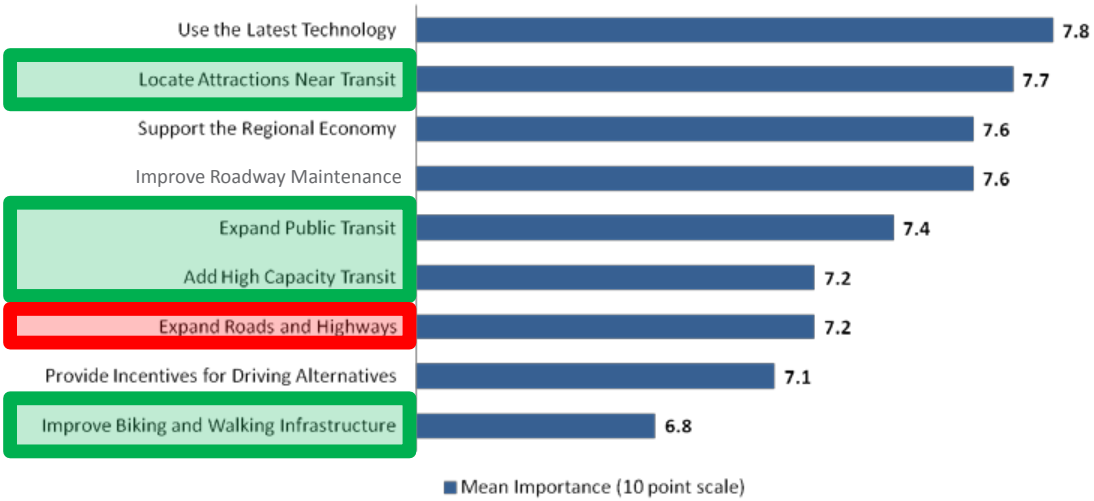
Growth and Transportation Strategies



Minority respondents were more likely to agree with expanding public transit, improving access to affordable housing, and reducing poverty and crime.

Charting Our Course

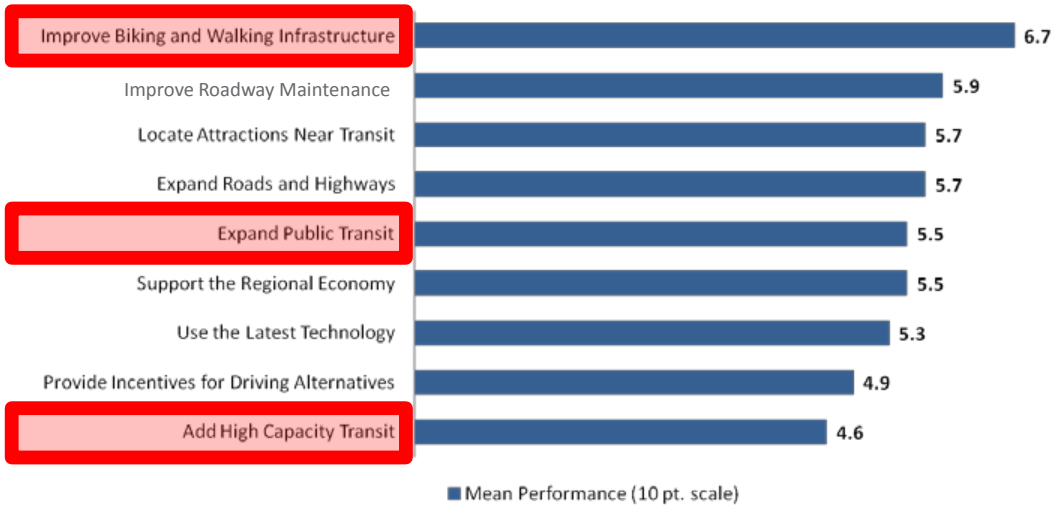
Transportation Priorities



Public respondents placed a higher priority on transit, bicycle, and pedestrian improvements and a lower priority on highway improvements.

Charting Our Course

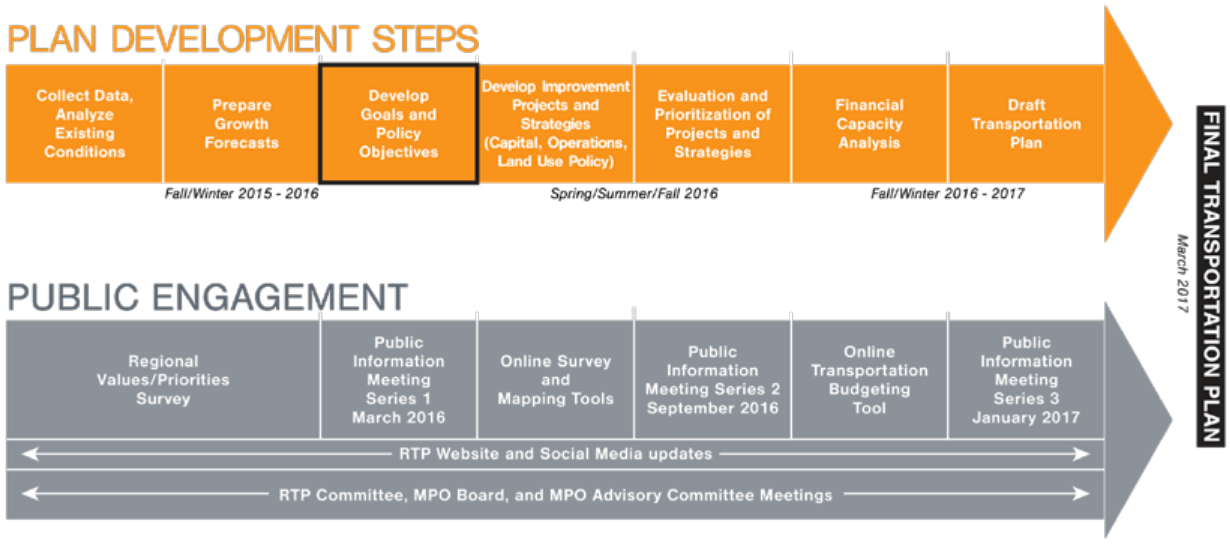
Transportation Performance



Public respondents reported lower performance levels for walking, biking, and transit than the panel respondents.

Charting Our Course

Regional Transportation Plan Process and Schedule



Charting Our Course

Draft Plan Goals

- Connect Neighborhoods and Communities
- Improve Public Health and Safety
- Support Personal Prosperity
- Enhance the Regional Economy
- Provide Equity
- Protect the Environment
- Ensure System-wide Efficiency and Reliability
- Ensure Integration across Modes
- Provide Financial Viability over Time
- Achieve Sustainable Funding Through Equitable & Sufficient Transp. Finance/Governance Mechanisms



We want to hear from you!

Small Group Discussion Questions

1. Draft Plan Goals
2. Transportation Priorities and Performance Assessment
3. Growth / Transportation Strategies
4. Important Challenges, Opportunities, or Other Issues
   - Examples – Funding, Technology



Madison Area Transportation Planning Board

www.MadisonAreaMPO.org

Regional Transportation Plan 2050

www.MadisonAreaRTP.com



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IDEAS THAT BUILD THE PLAN FOUNDATION

Small Group Discussion Questions

1. The draft Regional Transportation Plan (RTP) 2050 goals are similar to those in the current RTP. They are based upon the multi-pronged principles of sustainability – encompassing economic, social, and environmental dimensions. Do you agree with these goals? Would you modify any or add others?

2. The regional values/priorities survey asked people to rate the importance of selected transportation priorities and how they thought the region was doing on those priorities. Do your priorities and performance assessment align with the results of the survey? What two would you consider most important and why?

3. The regional values/priorities survey also asked people to indicate their support for selected growth/transportation strategies. Do you support these? Is there any major strategy missing? What two (including any added ones) would you consider most important and why?

4. What are the most important challenges, opportunities, or other issues that should be considered in developing the long-range transportation plan for the region? What two would you consider most important and why?

Regional Transportation Plan 2050 Madison Area
Charting Our Course

Draft Goals

The Transportation Network will . . .

DRAFT

Connect Neighborhoods
Built to be context sensitive, recognizing the importance of streets as shared public places that can foster community and that are safe and convenient for walking and bicycling, not just moving motor vehicles.

Improve Public Health and Safety
Designed, built, and operated to improve the health of the public-at-large while minimizing the risk of harm to all and protecting vulnerable users.

Support Personal Prosperity
Supports the financial well-being of citizens by providing a range of convenient and affordable transportation options throughout the region that connect people to jobs, services, shopping, and other destinations.

Enhance the Regional Economy
Promotes a vibrant economy by supporting the efficient movement of workers and goods.

Provide Equity
Serves everyone's needs regardless of age, gender, orientation, income, disability, race, or ethnicity.

Protect the Environment
Protects and preserves the natural environment, minimizes energy consumption, and reduces greenhouse gas emissions to combat global warming.

Ensure System-wide Efficiency & Reliability
Maximizes the mobility of the system while minimizing unexpected delays, and supports efficient development patterns.

Ensure Integration across Modes
Ensures seamless access to all transportation modes/services and ease of transfer between them.

Provide Financial Viability over Time
Incorporates cost efficiency and economic viability considerations by examining life cycle costs of all projects, including operations and maintenance.

Regional Transportation Plan 2050 Madison Area
Charting Our Course

Draft Goals

The Transportation System will . . .

DRAFT

Connect Neighborhoods and Communities
Creates inter-connected places to live, work, and play through a transportation system that is integrated with the built environment and supports compact urban development patterns. Recognizes the importance of urban streets as shared public places that can foster community and that are safe and convenient for walking and bicycling, not just moving motor vehicles.

Improve Public Health and Safety
Designed, built, and operated to improve the health of the public-at-large while minimizing the risk of harm to all and protecting vulnerable users.

Support Personal Prosperity
Supports the financial well-being of citizens by providing a range of convenient and affordable transportation options throughout the region that connect people to jobs, services, shopping, and other destinations.

Enhance the Regional Economy
Promotes a vibrant economy by supporting the efficient movement of workers and goods.

Provide Equity
Provides equitable opportunity for all regardless of age, gender, orientation, income, disability, race, or ethnicity by providing transportation options to access daily needs.

Protect the Environment
Protects and preserves the natural environment, minimizes energy consumption, and reduces greenhouse gas emissions to combat global warming.

Ensure System-wide Efficiency & Reliability
Maximizes the mobility of the system while minimizing unexpected delays, and supports efficient development patterns.

Ensure Integration across Modes
Ensures seamless access to all public and private transportation modes/services and ease of transfer between them.

Provide Financial Viability over Time
Incorporates cost efficiency and economic viability considerations by examining life cycle costs of all projects, including operations and maintenance.

Achieve Sustainable Funding Through Transportation Finance/Governance Mechanisms
Provides the resources necessary to meet the region's transportation needs, leveraging existing mechanisms and public-private partnerships, while encouraging the development of new ones such as regional transit/transportation authorities.

2/26/16

Published on *Madison Area Regional Transportation Plan 2050* (https://madisonareartp.com)

Public Involvement Meetings Series I: Summary of Key Findings

Posted by MATPB on Wed, 03/09/2016 - 1:39pm

The first series of public engagement meetings supporting the Regional Transportation Plan update has been completed. The MATPB hosted meetings in Madison, Verona, and Sun Prairie on March 2, 3, and 7 respectively. At each of the meetings, attendees were given the opportunity to review informational boards about planned and forecast growth, demographic and economic trends, and the transportation system, view a presentation about the regional transportation planning process, and provide input on the important issues, needs, challenges, and opportunities facing the region during a group activity [1].

During the group activity, the following are some of the significant themes that emerged:

- **Transportation Funding**– Strong support for Regional Transportation/Transit Authorities (RTAs) and alternative transportation funding mechanisms. An RTA would allow for truly regional transit service and allow for local service in suburban communities. If an RTA is not feasible, a use-based fee/tax could allow for funding of local projects and encourage more local control over the transportation network. Funding must be sustainable.
- **The Economy** – The link between transportation and the economy should be emphasized. There is a need for improved facilities/service providing connections between housing and jobs/destinations across all modes, particularly in areas outside of the central city.
- **Equity** – The equity goal should be more inclusive than currently defined.
- **Mode Choice & Connectivity** – Regardless of location, citizens should have the ability to choose between a variety of transportation options with the ability to live a "car-free" lifestyle, if desired. We should work to retrofit existing roads with bicycle and pedestrian facilities.
- **Land Use** – The transportation network should support efficient, compact land use patterns. Land use patterns that support transit should be encouraged. Where applicable, encourage retrofitting in increased densities and mixed use to support public transportation.
- **Transit** – Regional transit and local transit for suburban communities is desired. There is a strong desire to increase transit service frequency, capacity, and service

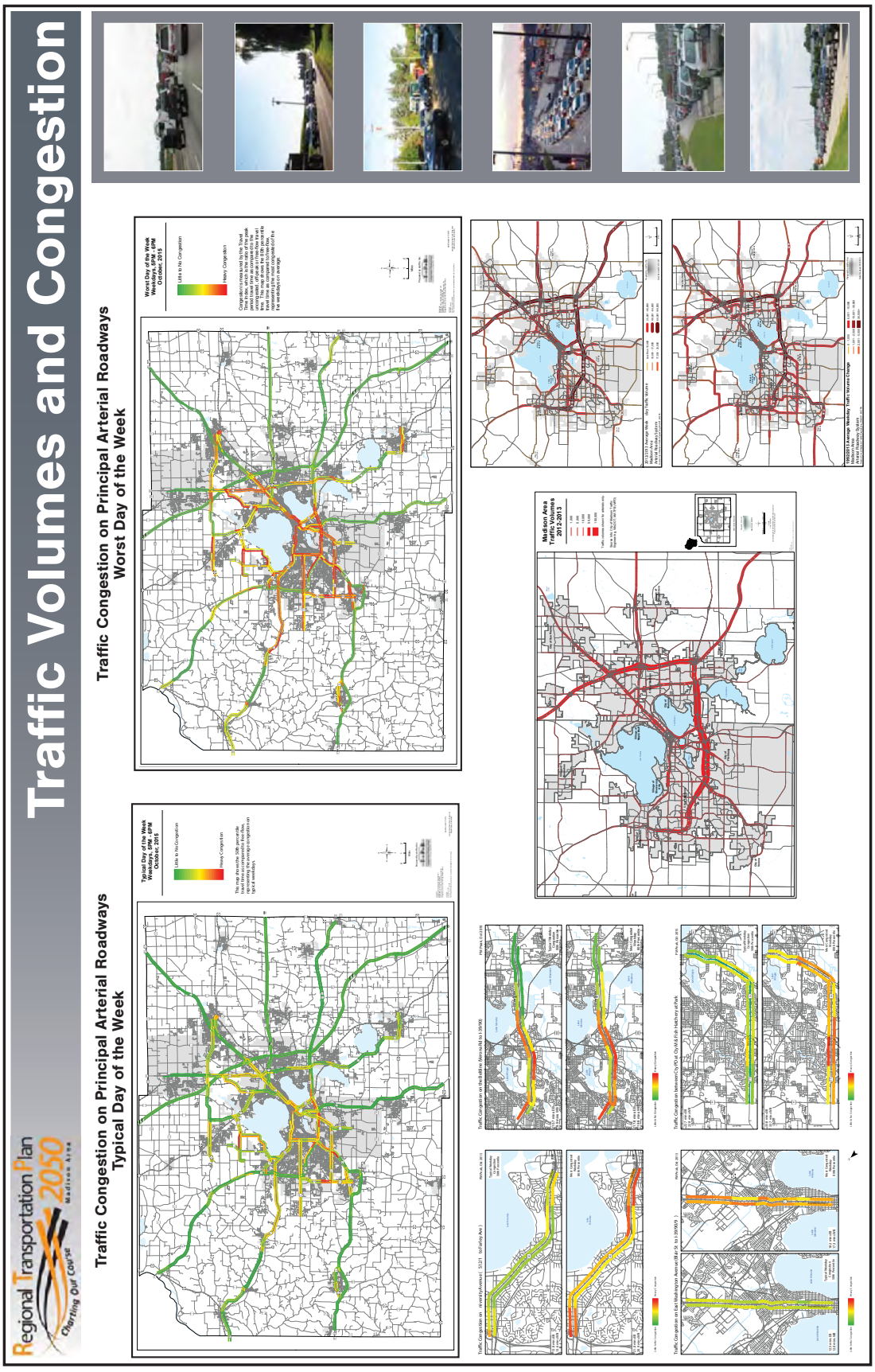
area. Paratransit service areas should be expanded. Transit between suburban communities should be supported as well. Suburban communities should explore alternative forms of transportation – shared ride taxis, car sharing, and new technologies as they become available.

- **Health & Safety** – The definition of health in the plan goals should be expanded to include "improve access to healthy food." The links between topics should be strengthened.
- **Technology** – The transportation network should adapt to new technologies as they become available. Regionally, we must be aware of new technologies, such as autonomous transit, that could solve issues that are on the horizon, such as baby-boomers' desire to age in place.

The MATPB will use the feedback from the meetings to inform plan development and to revise goals. New plan goals will be posted once they are available.

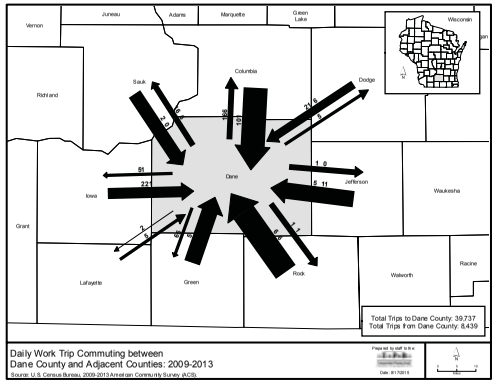
Source URL: https://madisonareartp.com/thank-you-your-participation

Links:
[1] http://madisonareartp.com/document/public-involvement-meeting-1-group-activity-packet


Traffic Volumes and Congestion
Regional Transportation Plan 2050
Madison Area
Charting Our Course
Traffic Congestion on Principal Arterial Roadways
Typical Day of the Week
Traffic Congestion on Principal Arterial Roadways
Worst Day of the Week
Madison Area
Traffic Volumes
2012-2013

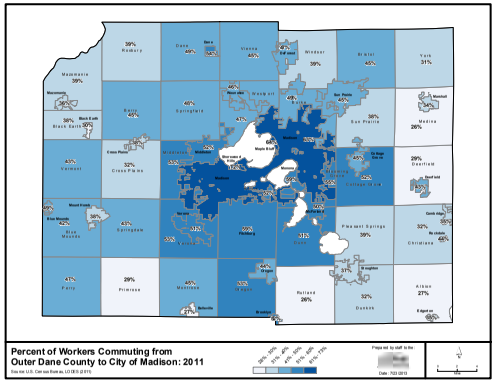
Regional Transportation Plan 2050 Madison Area — Charting Our Course

Commuting



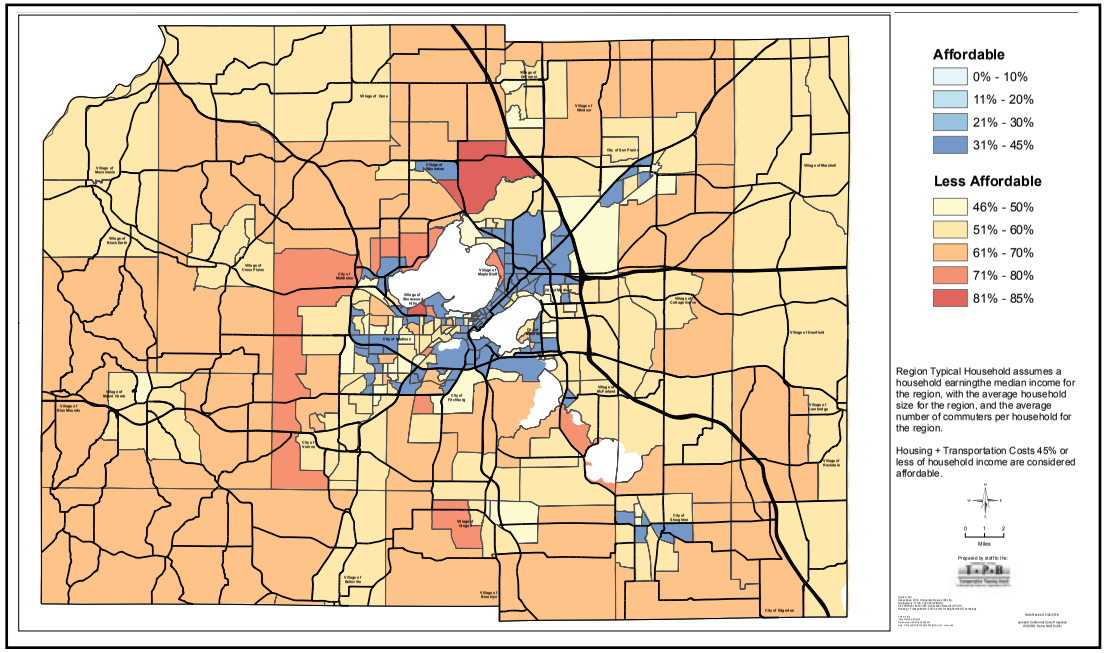
Daily Work Trip Commuting between
Dane County and Adjacent Counties: 2009-2013

Source: U.S. Census Bureau, 2009-2013 American Community Survey (ACS).

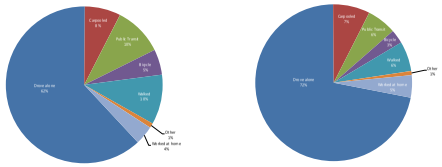


Percent of Workers Commuting from
Outer Dane County to City of Madison: 2011

Combined Housing and Transportation Costs as a % Income for the Region Typical Households

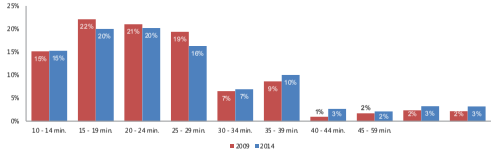


Mode of Transportation to Work - 2014

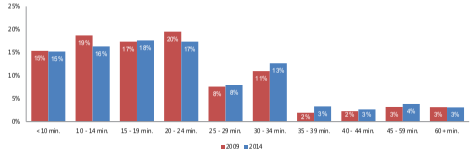


Source: 2014 American Community Survey (ACS) 1-year estimates

Travel Time to Work
City of Madison

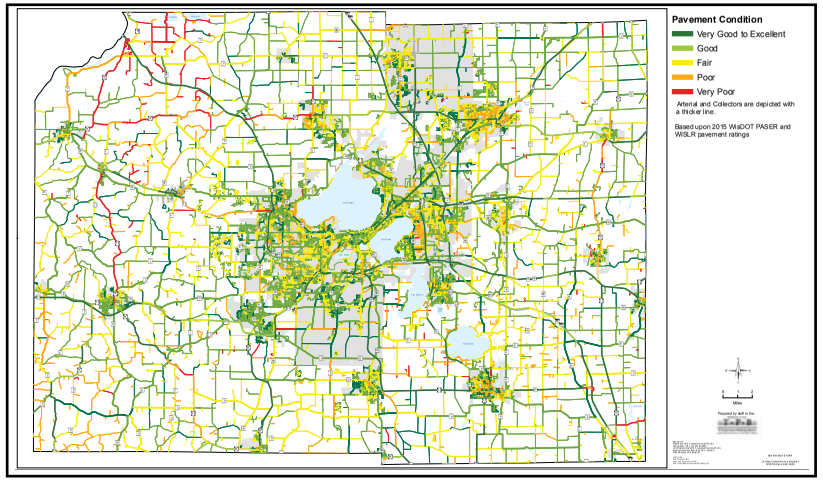


Travel Time to Work
Dane County

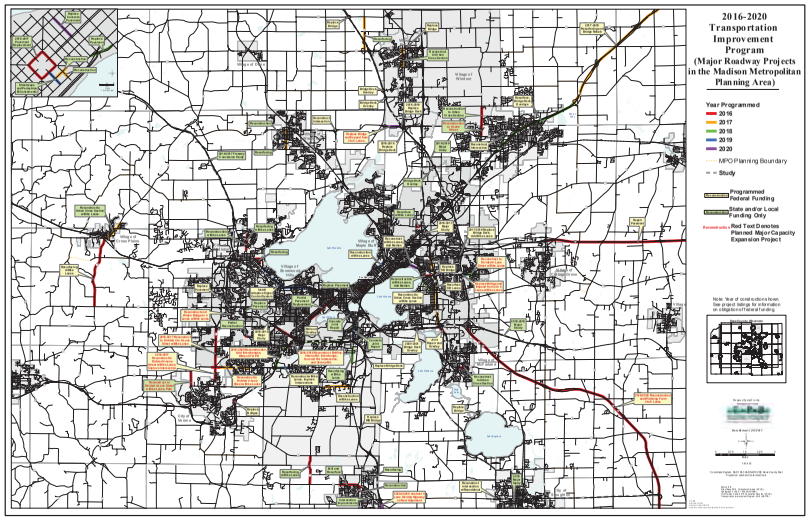


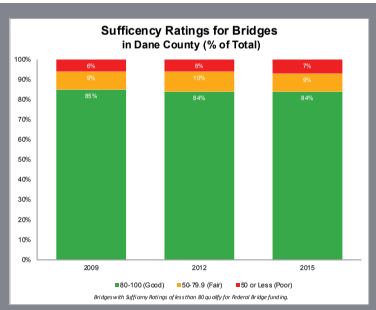
Existing Roadway Conditions & Future Projects

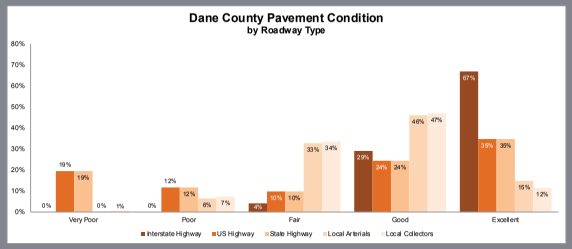
Pavement Condition of Dane County Roadways



2016 -2020 Transportation Improvement Program







Estimated Daily Vehicle Miles of Travel (VMT) for Dane County

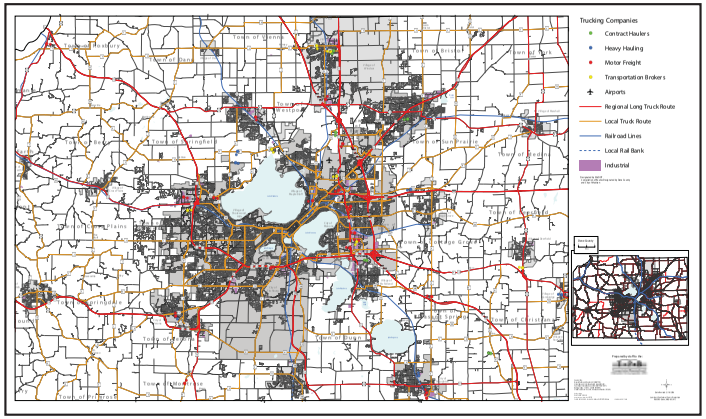
Year	Est. Daily VMT	Change from Previous Year
2007	13,561,096	-
2008	13,029,041	-3.9%
2009	13,214,247	1.4%
2010	13,258,276	0.3%
2011	13,116,507	-1.1%
2012	13,724,431	4.6%
2013	13,290,950	-3.2%
2014	13,481,513	1.4%

Annual Crashes per 1,000,000 Vehicle Miles of Travel (VMT) for Dane County

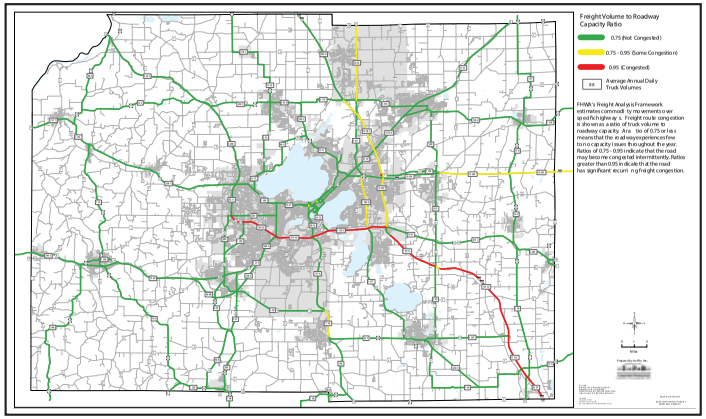
Year	Fatal	Injury	Property Only
2007	0.009	0.607	1.249
2008	0.007	0.567	1.400
2009	0.007	0.509	1.241
2010	0.007	0.516	1.273
2011	0.007	0.508	1.305
2012	0.005	0.469	1.213
2013	0.007	0.488	1.413
2014	0.006	0.490	1.496

Freight

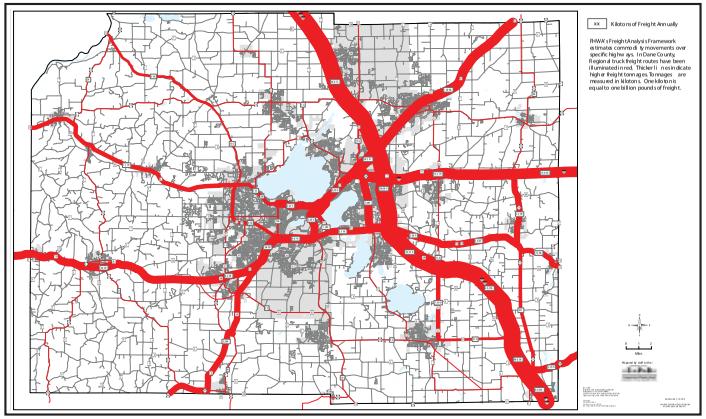
Freight Routes, Facilities, and Service



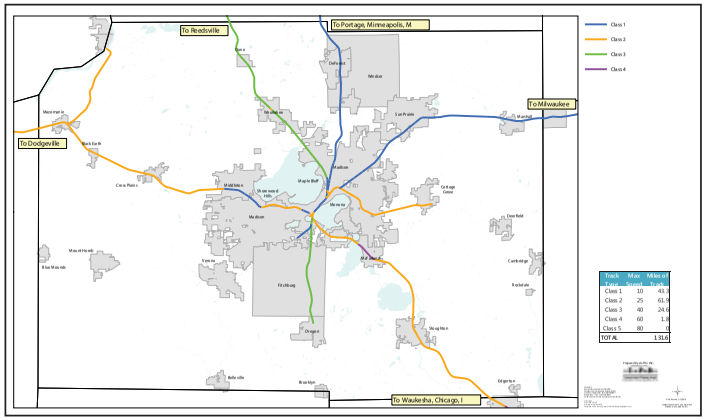
Freight Truck Traffic Congestion (2007)

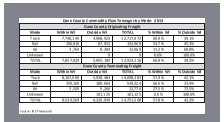


Annual Truck Freight Tonnages (2007)



Rail Network





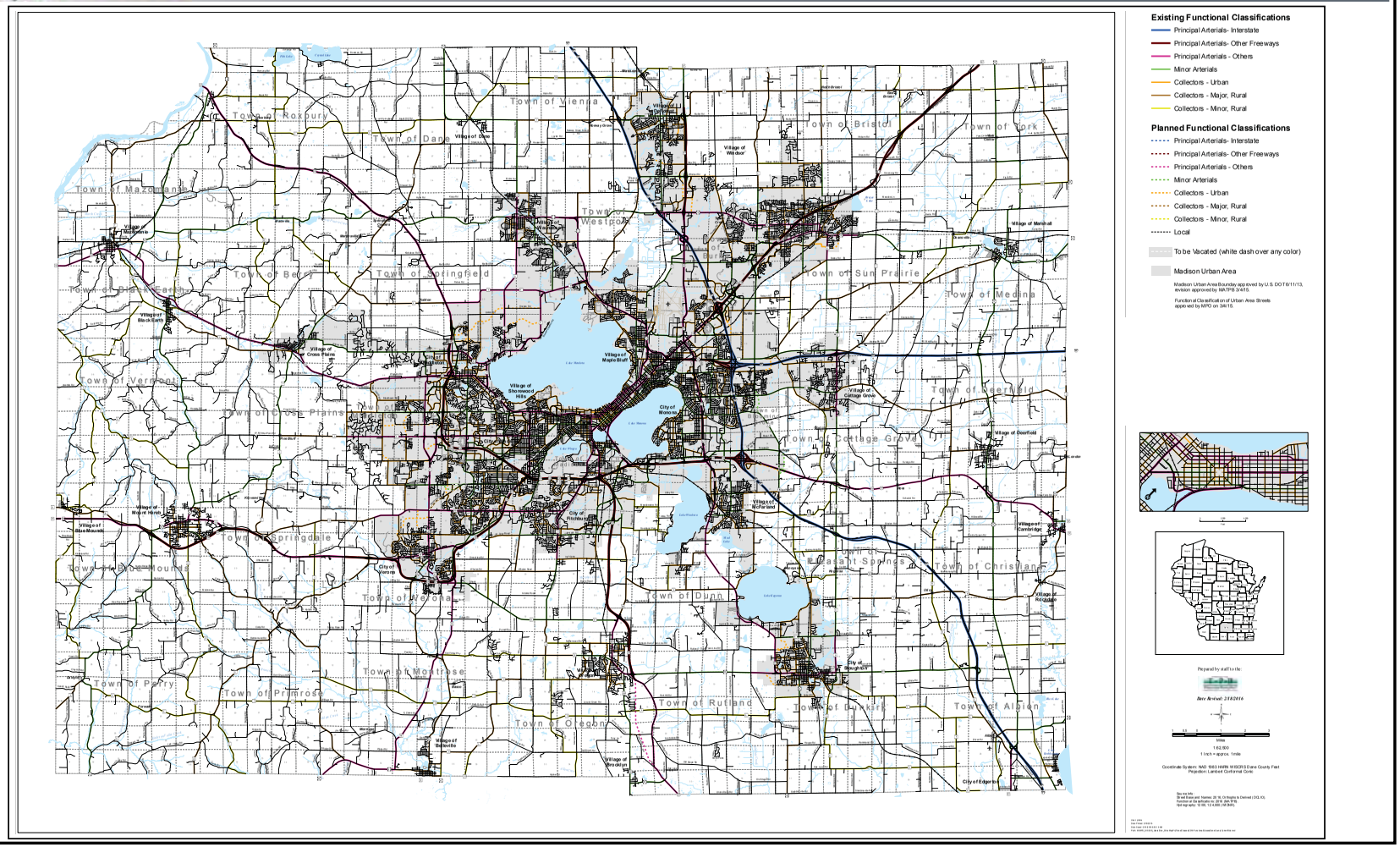






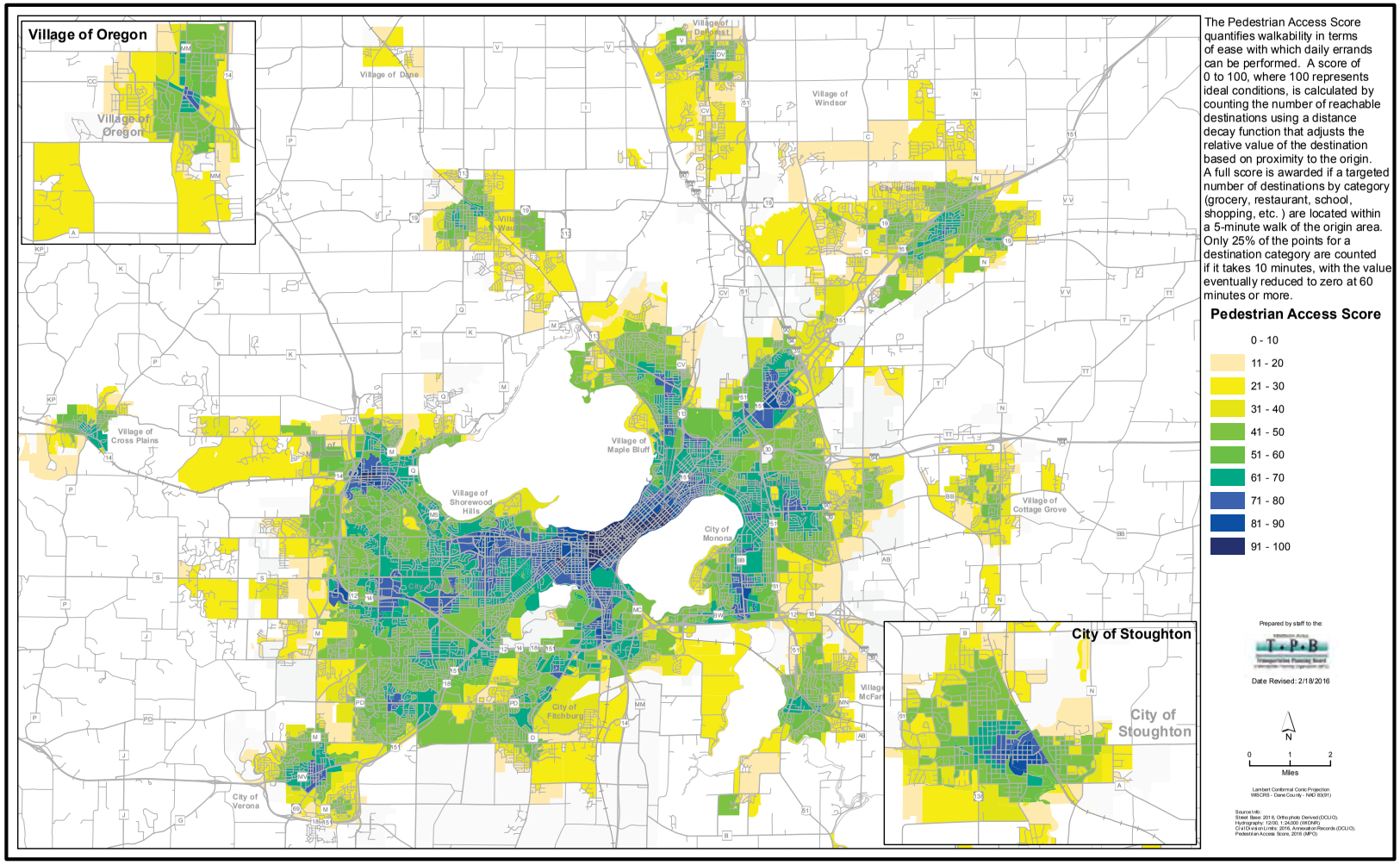


Roadway Functional Classification System



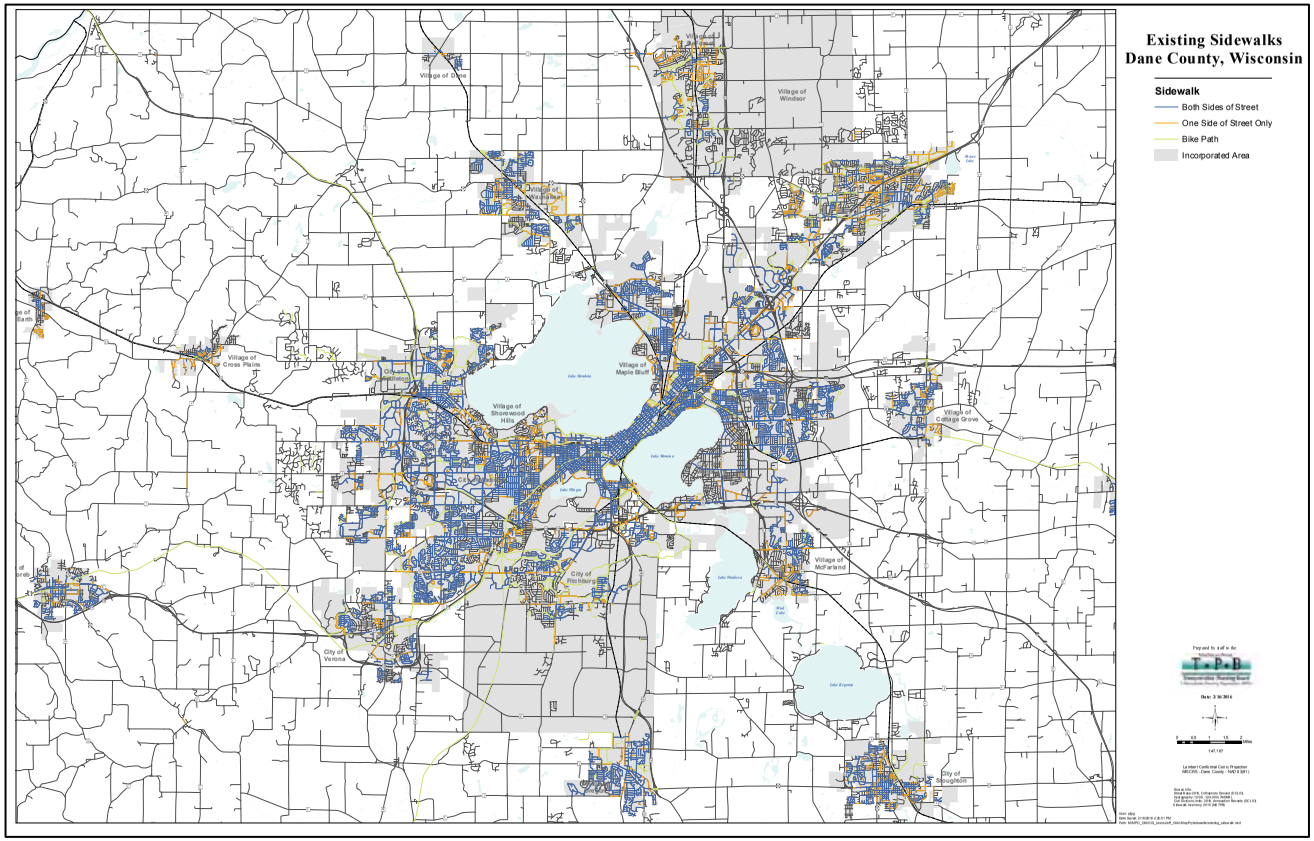
Regional Transportation Plan 2050 Madison Area
Charting Our Course

Pedestrian Accessibility



Regional Transportation Plan 2050 Madison Area
Charting Our Course

Pedestrians







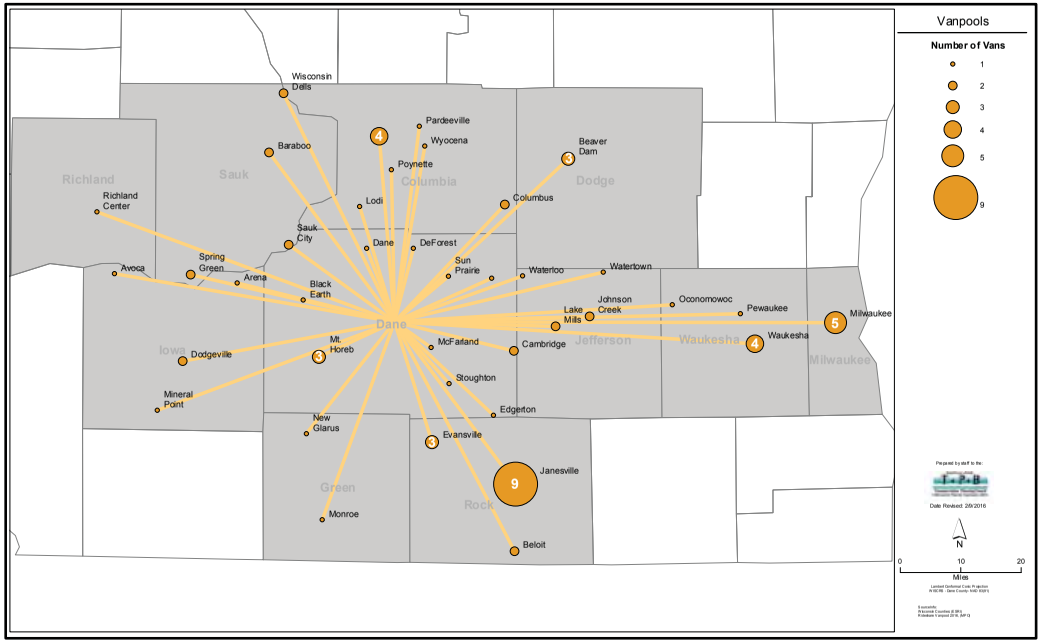




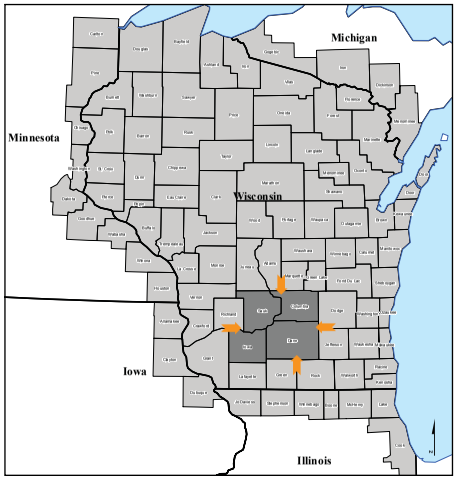
Sidewalk Mileage

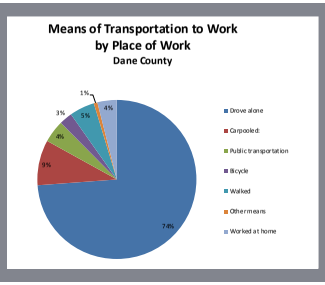
	Madison Urban Area 2015	City of Madison	Dane County
Sidewalk Both Sides	890	583	980
Sidewalk One Side Only	279	121	322
Total Miles	**1,169**	**704**	**1,302**

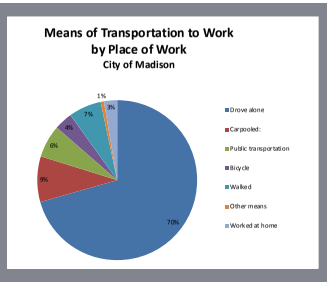
Commuter Options



Rideshare Etc Service Area







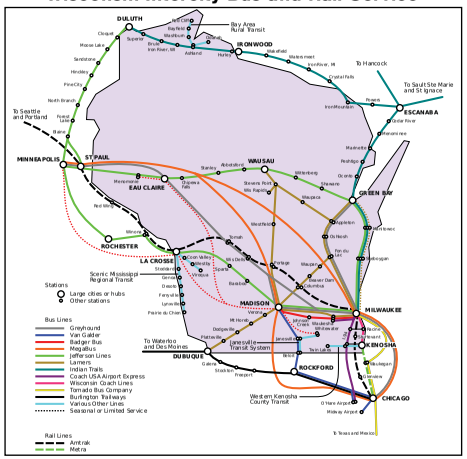




Regional Transportation Plan 2050 Madison Area — Charting Our Course

Intercity Transit

Wisconsin Intercity Bus and Rail Service

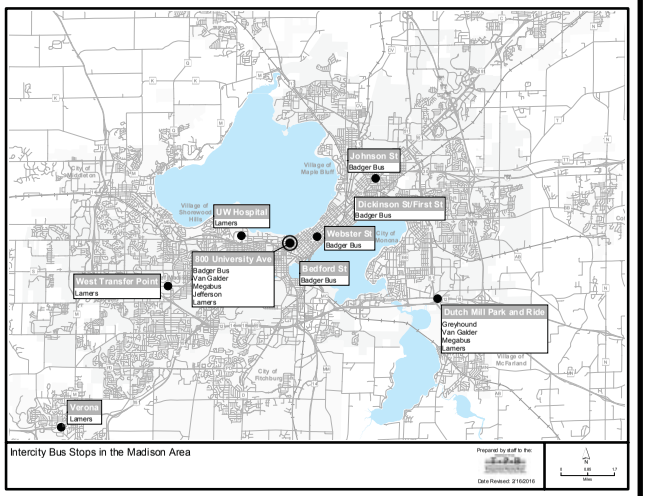


Daily Intercity Bus Trips Between Madison and Selected Destinations

	Chicago	Milwaukee	Minn/St Paul	Green Bay	Wis Rapids	Dubuque
Greyhound	1-2	1-2	1-2			
Van Galder	13-14					
Badger Bus		8				
MegaBus	4		4			
Jefferson		1	1			
Lamers		1		1	1	1
Total	**18-20**	**11-12**	**6-7**	**1**	**1**	**1**



St Paul Union Depot is a renovated train station that serves as a hub for intercity buses and trains.
Source: Madison Area Transportation Planning Board



Intercity Bus Stops in the Madison Area

Amtrak Service in the Midwest



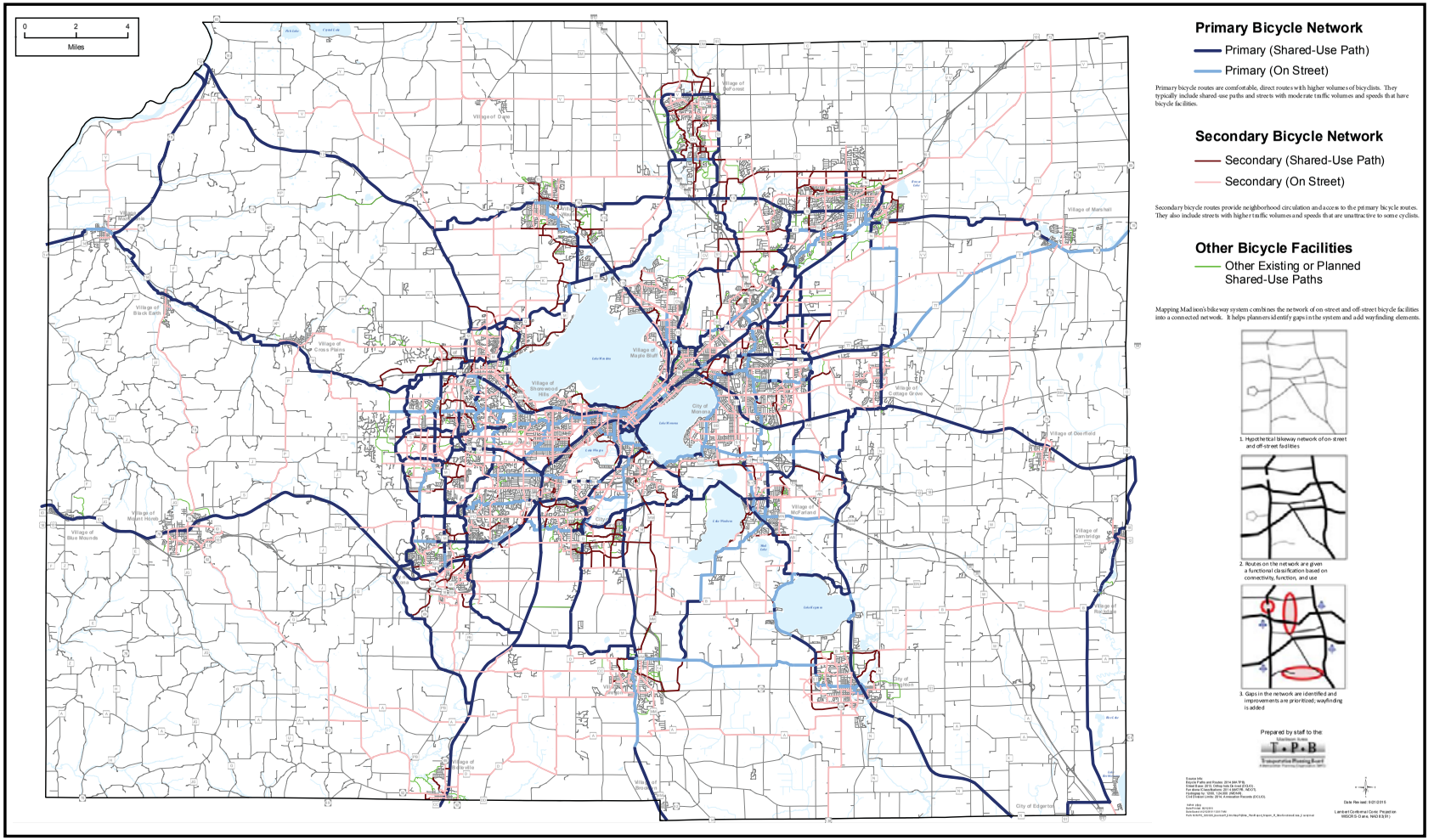


Source: Madison Area Transportation Planning Board

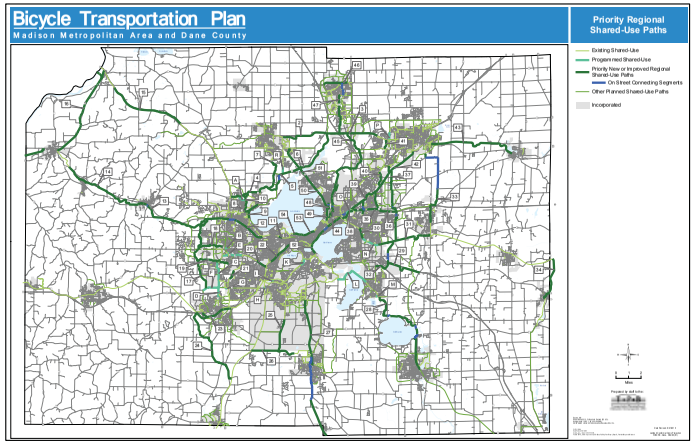


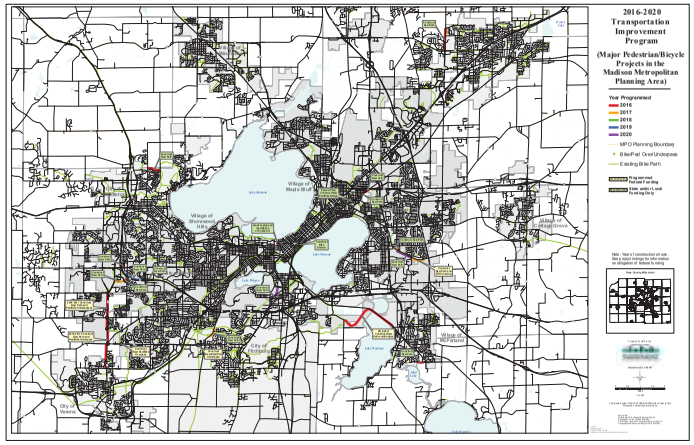
Source: Madison Area Transportation Planning Board

Planned Bicycle Route Network

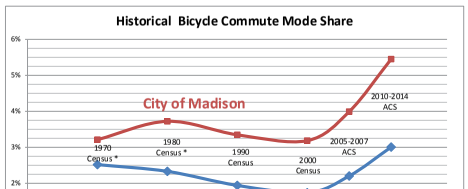


Bicycle Transportation

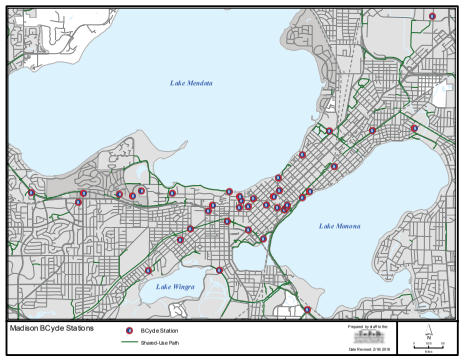


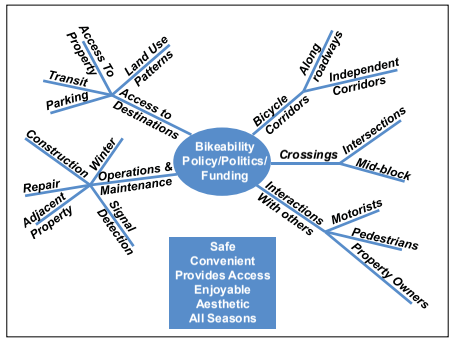




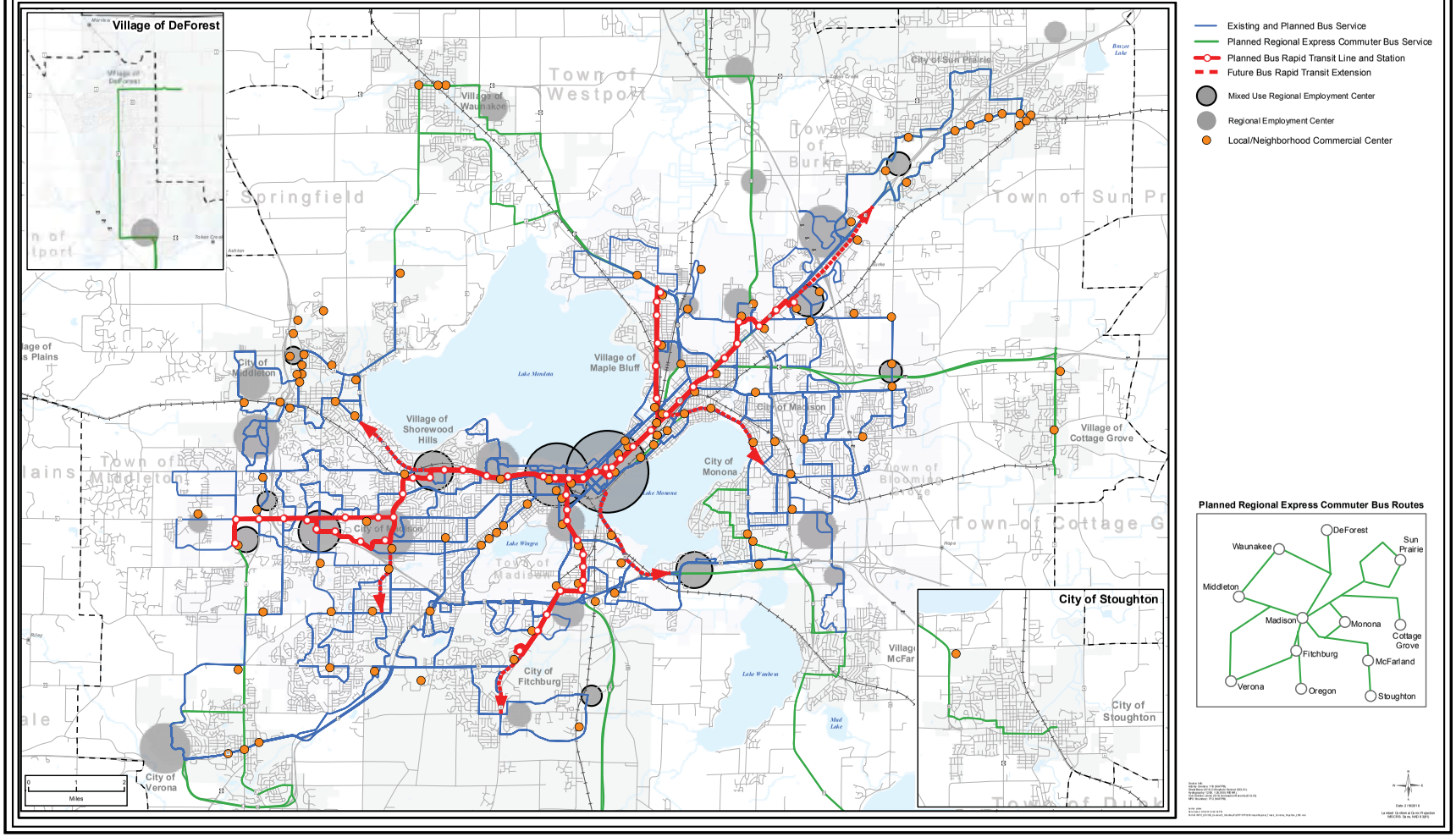


On-Street/Off-Street Bicycle Facilities Mileage		
	Shared-Use Mileage	Bike Lane Mileage
Madison Urban Area 2015	229	150
City of Madison	80	97
Dane County	293	154





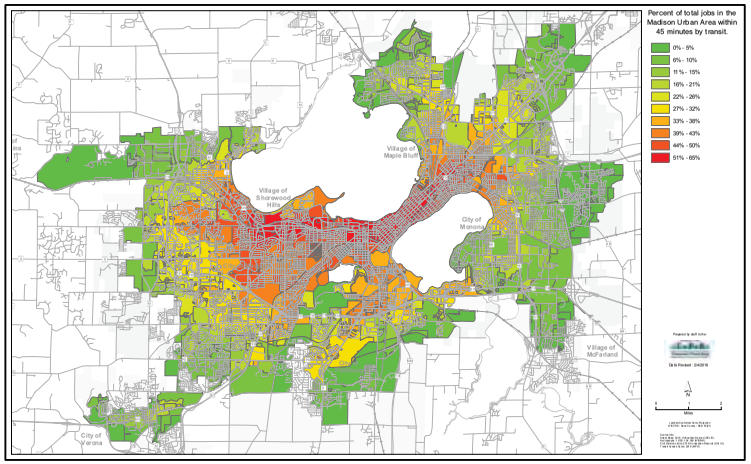
Planned Regional Transit Corridors & Activity Centers



Regional Transportation Plan 2050 Madison Area
Charting Our Course

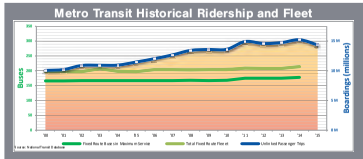
Public Transportation

Transit Access to Jobs

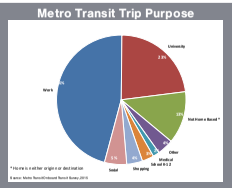




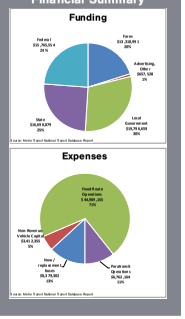
Metro Transit Historical Ridership and Fleet



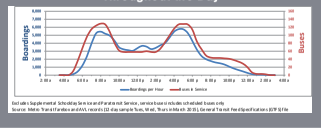
Metro Transit Trip Purpose



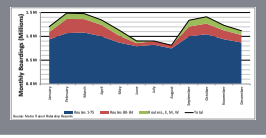
2014 Metro Transit Financial Summary

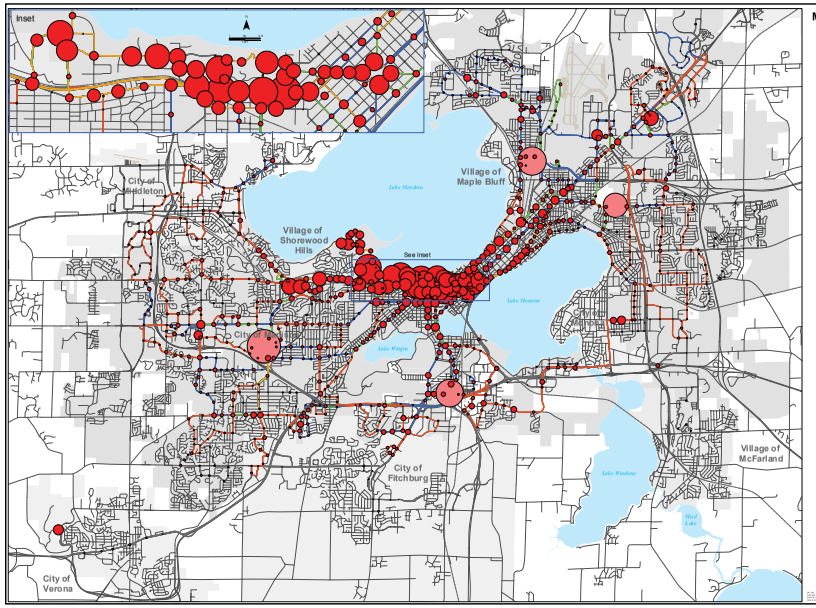


Metro Transit Ridership and Service Buses Throughout the Day



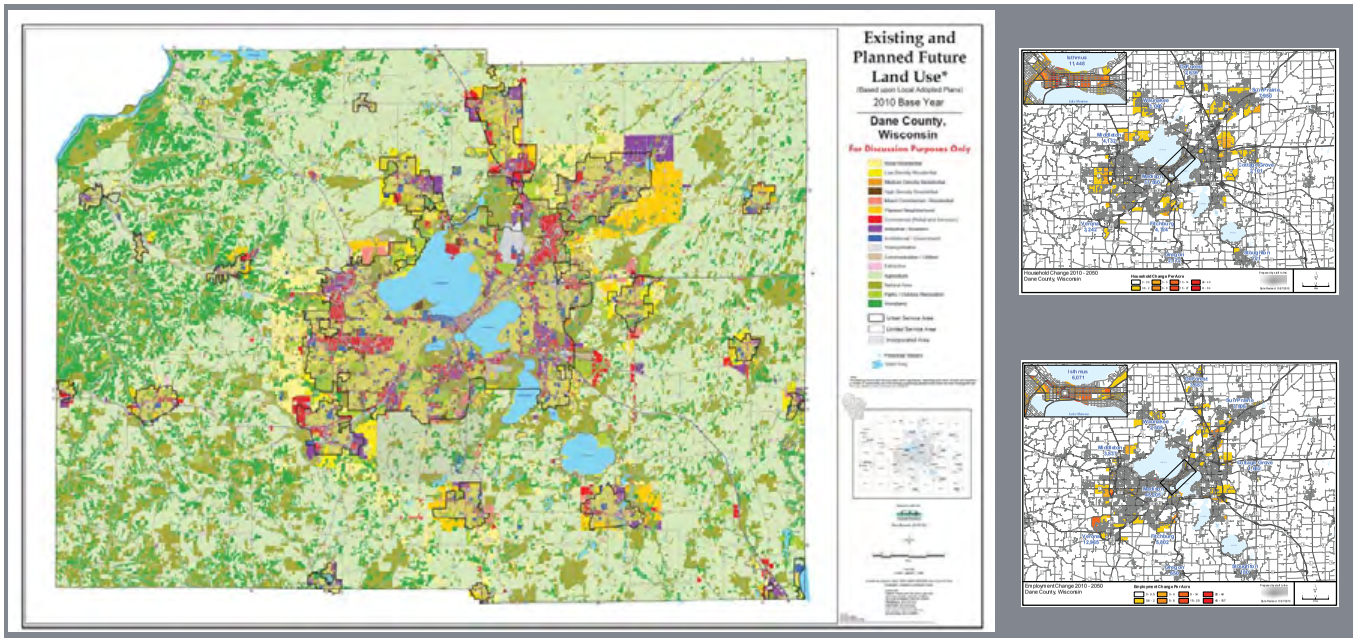
Metro Transit Month to Month Ridership





Regional Trends & Development

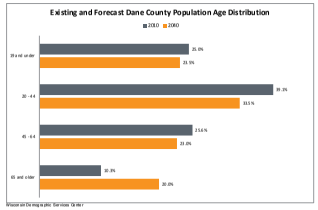
Planned and Forecast Growth

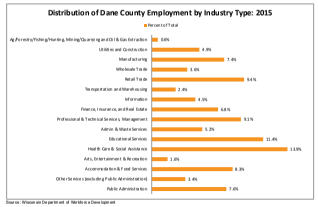


Demographic and Economic Trends

Race	Number 2010	Percent Total 2010	Percent Increase 2000-2010
White	413,631	84.8%	9.0%
Black/African American	25,347	5.2%	48.5%
Asian	23,035	4.7%	56.3%
Other Minority	13,960	2.8%	82.4%
Two or More Races	12,100	2.5%	58.8%
Total Population	**488,073**	**100.0%**	**14.4%**

Ethnicity	Number 2010	Percent Total 2010	Percent Increase 2000-2010
Hispanic	28,925	6.0%	101.1%
Non Hispanic	459,148	94.0%	11.4%
Total Population	**488,073**	**100.0%**	**14.4%**





2050 Population Forecast

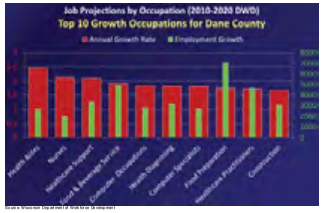
Urban Service Area (USA)/Municipality	2010 Census Population	2010 Census % of County Total	2050 Forecast Population	2050 Forecast % of County Total	2010 - 2050 Change Population Chg Number	2010 - 2050 Change Population Chg Percent
Central Urban Service Area (CUSA)	342,241	70%	479,311	70%	137,070	40%
City of Madison	234,618	48%	292,522	46%	57,904	25%
City of Fitchburg	25,413	5%	34,370	5%	8,957	35%
City of Middleton	17,548	4%	24,571	4%	7,023	40%
Village of McFarland	7,856	2%	10,379	2%	2,524	32%
Inner Ring (ICA) Total	285,435	58%	361,842	53%	76,407	27%
City of Sun Prairie	29,364	6%	50,883	8%	21,519	73%
City of Stoughton	12,611	3%	14,366	2%	1,755	14%
City of Verona	10,619	2%	18,840	3%	8,221	77%
Village of Cottage Grove	6,192	1%	10,594	2%	4,402	71%
Village of Waunakee	12,097	2%	19,279	3%	7,182	59%
Northern (DeForest/Windsor)	12,997	3%	20,794	3%	7,797	60%
Village of Oregon	9,231	2%	13,619	2%	4,388	48%
Outlier Total (OA)	23,740	5%	28,313	5%	4,573	19%
Rural Total	**65,998**	**14%**	**73,785**	**12%**	**7,787**	**12%**
County Total	**488,073**		**637,429**		**149,356**	**31%**

2050 Household Forecast

Urban Service Area (USA)/Municipality	2010 Census Households	2010 Census % of County Total	2050 Forecast Households	2050 Forecast % of County Total	2010 - 2050 Change Household Chg Number	2010 - 2050 Change Household Chg Percent
Central Urban Service Area (CUSA)	189,197	81%	277,781	75%	88,584	47%
City of Madison	103,132	51%	138,781	49%	35,649	35%
City of Fitchburg	10,015	5%	14,506	5%	4,491	45%
City of Middleton	8,085	4%	12,017	4%	3,932	49%
Village of McFarland	3,097	2%	4,268	2%	1,171	38%
Inner Ring (ICA) Total	124,329	53%	169,572	46%	45,243	36%
City of Sun Prairie	11,636	6%	21,822	8%	10,186	88%
City of Stoughton	5,133	3%	8,308	2%	1,175	23%
City of Verona	4,223	2%	8,104	3%	3,881	92%
Village of Cottage Grove	2,210	1%	4,096	1%	1,886	85%
Village of Waunakee	4,344	2%	7,486	3%	3,142	72%
Northern (DeForest/Windsor)	5,029	2%	8,866	3%	3,837	76%
Village of Oregon	3,589	2%	5,724	2%	2,135	59%
Outlier Total (OA)	10,672	4%	13,761	5%	3,089	29%
Rural Total	**24,917**	**12%**	**29,100**	**10%**	**4,183**	**17%**
County Total	**203,756**		**285,184**		**81,428**	**40%**

2050 Employment Forecast

Urban Service Area (USA)/Municipality	2010 (InfoUSA) Employment	2010 (InfoUSA) % of County Total	2050 Forecast Employment	2050 Forecast % of County Total	2010 - 2050 Change Employment Chg Number	2010 - 2050 Change Employment Chg Percent
Central Urban Service Area (CUSA)	283,672	86%	377,811	81%	94,139	33%
City of Madison	195,888	62%	241,093	60%	45,205	23%
City of Fitchburg	12,165	4%	17,967	5%	5,802	48%
City of Middleton	19,104	6%	22,941	6%	3,837	20%
Village of McFarland	1,943	1%	2,511	1%	568	29%
Inner Ring (ICA) Total	229,100	73%	284,512	71%	55,412	24%
City of Sun Prairie	11,362	4%	15,168	4%	3,806	34%
City of Stoughton	6,443	2%	6,623	2%	180	3%
City of Verona	9,315	3%	22,280	6%	12,965	139%
Village of Cottage Grove	2,625	1%	4,287	1%	1,662	63%
Village of Waunakee	5,901	1%	8,406	2%	2,505	42%
Northern (DeForest/Windsor)	6,054	2%	9,737	2%	3,683	61%
Village of Oregon	3,392	1%	4,042	1%	650	19.16%
Outlier Total (OA)	5,472	2%	11,472	3%	6,000	110%
Rural Total	**9,474**	**3%**	**9,560**	**2%**	**87**	**1%**
County Total	**317,711**		**398,565**		**80,540**	**25%**



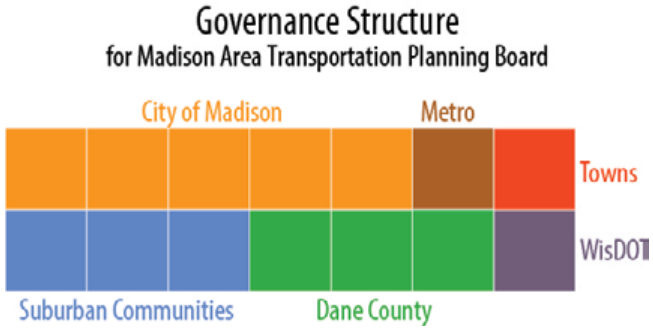


INTRODUCTION

- What is the Madison Area Transportation Planning Board (MATPB)?
- What is the primary MATPB planning area?
- What is the Regional Transportation Plan (RTP)?
- Where are we at in the RTP Planning Process?
- What happened at the last set of meetings?
- What has happened since the last meetings?
- What are we going to do tonight?
- What comes next?

WHAT IS MATPB?

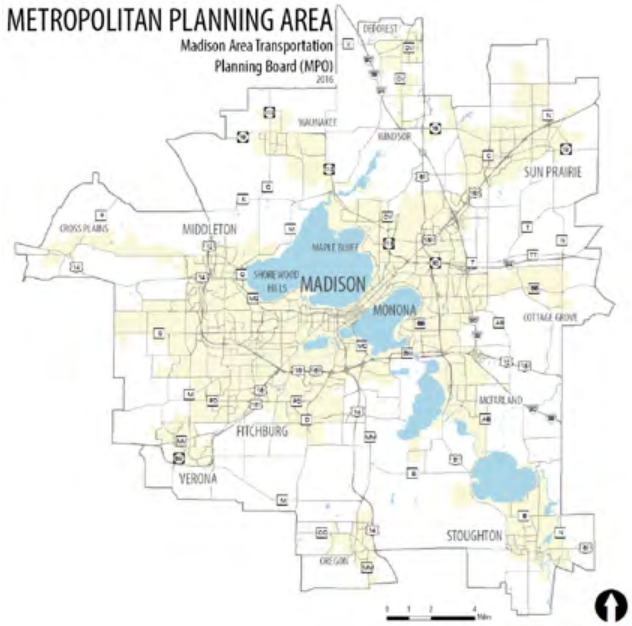
- Metropolitan Area Transportation Planning Policy Body
  - Responsible for cooperative regional transportation planning and decision-making
  - Approves use of federal transportation funding
  - Designated by Governor as Metropolitan Planning Organization (MPO) for Madison Urban Area
  - Formal intergovernmental agreement signed by local units of government representing over 75% of metro area population (May 2, 2007)



3

PRIMARY MATPB PLANNING AREA

- Official jurisdictional area of MPO, within which federal planning requirements apply
- Must cover existing urbanized area boundary (defined by US Census Bureau every 10 years)
- Also covers contiguous area expected to become urbanized within 20+ year period, including important regional transportation corridors



4

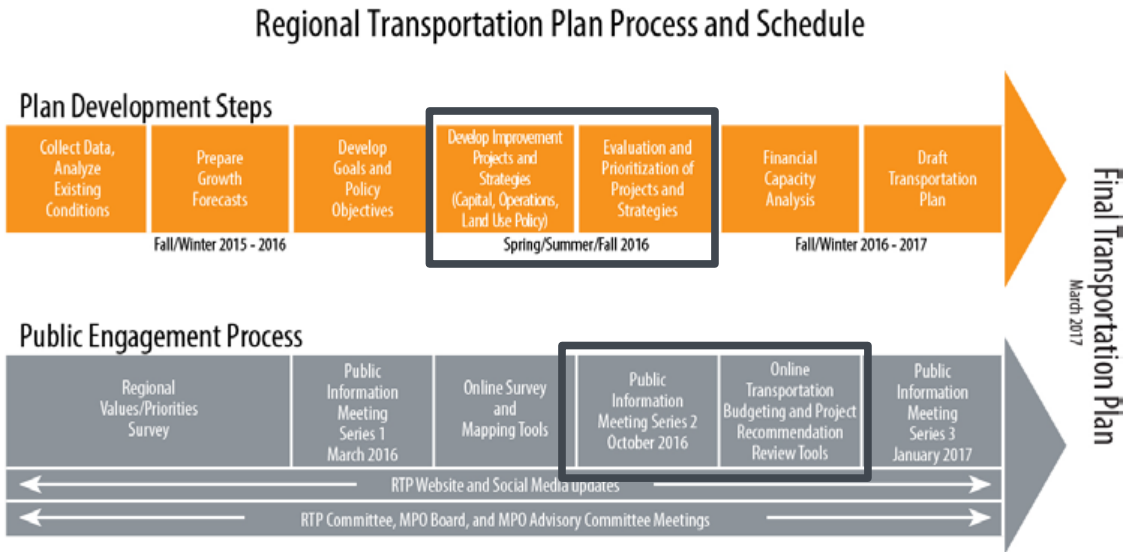
WHAT IS THE RTP?

- Integrated, multi-modal, long-range transportation plan providing the overall framework for transportation planning in the region.
- Official plan for federal and state funding purposes
- Based upon and designed to support the regional land use policy plan and local comprehensive plans of Dane County communities
- Identifies future transportation projects, studies, and strategies/actions to be implemented by WisDOT, MPO, local jurisdictions over the next 20+ years
- Financially constrained plan
- Updated every 5 years



5

WHERE ARE WE IN THE PROCESS?



6

WHAT HAPPENED AT THE PAST MEETINGS?

- First series of involvement meetings held during March 2016 in Madison, Verona, and Sun Prairie
- Provided an introduction to the RTP
- Reviewed regional background information, such as demographics, economic trends, and the existing transportation system
- Attendees provided input on issues, needs, challenges, and opportunities in the region
- Attendees helped form and refine plan goals


Madison


Verona


Sun Prairie

7

WHAT HAPPENED AT THE PAST MEETINGS?

Overall Feedback

- **Funding**
  - Strong support for a Regional Transportation/Transit Authority that could leverage a local fee or tax to fund transportation needs.
- **The Economy**
  - Link between transportation and the economy needs to be emphasized in the RTP, specifically the need for improved connections to jobs and other destinations across all modes, especially in areas outside of the central city.
- **Equity**
  - Equity should be a primary goal and must be specifically defined.
- **Mode Choice and Connectivity**
  - Citizens should have the ability to choose between a variety of transportation options with the ability to live a car-free or "car-light" lifestyle, if desired.
- **Land Use**
  - The transportation network should support compact land use patterns.
  - Land use should support transit in urban areas.
  - Retrofit increased densities into existing and planned transit corridors.

8

WHAT HAS HAPPENED SINCE THE LAST MEETINGS?

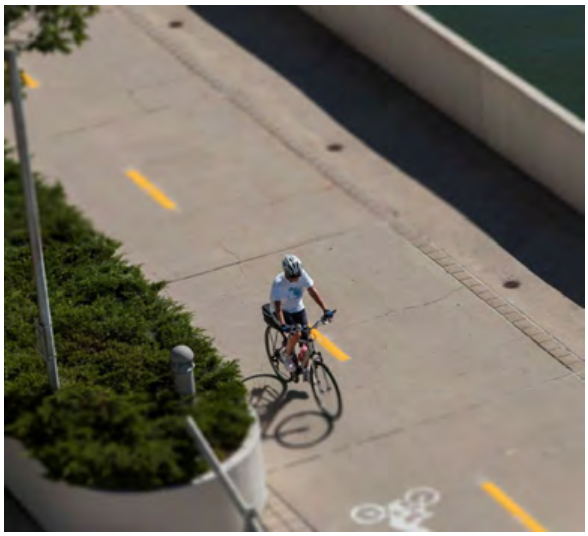
Overall Feedback (continued)

- **Transit**
  - Transit should be expanded to suburban communities, including adding commuter routes and local suburban service. Frequency, capacity, and service areas should expand.
  - Transit between suburban communities should be explored.
  - Suburban communities should explore alternative forms of transit, such as shared ride taxis, ride hailing services, and other new technologies as they become available.
- **Health and Safety**
  - Plan goals should be expanded to include "improving access to healthy food."
  - Link between health and planning should be strengthened.
- **Technology**
  - The transportation network and transit service should adapt to new technologies as they become available.
  - Special attention should be paid to technologies such as autonomous transit that could solve regional issues, such as how to provide transportation to baby boomers as they age in place.

9

WHAT HAS HAPPENED SINCE THE LAST MEETINGS?

- Goals have been finalized and draft policies developed
- Initial plan chapters have been written
- Travel forecast model has been calibrated, prelim. forecasts prepared
- Facility needs have been identified and transit and bicycle recommendations developed

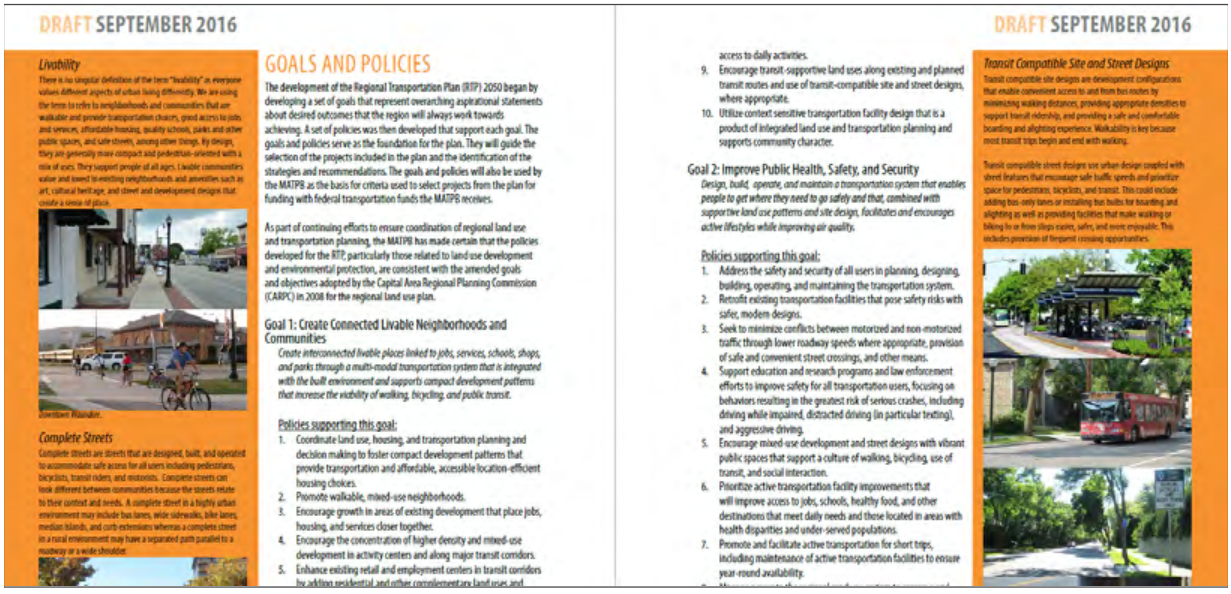


10

REGIONAL TRANSPORTATION PLAN GOALS

1. Create Connected Livable Neighborhoods and Communities
2. Improve Public Health, Safety, and Security
3. Support Personal Prosperity and Enhance the Regional Economy
4. Improve Equity for All that Use the Transportation System
5. Reduce the Environmental Impact of the Transportation System
6. Advance System-wide Efficiency, Reliability, and Integration Across Modes
7. Establish Financial Viability of the Transportation System

DRAFT GOALS AND POLICIES CHAPTER



DRAFT SEPTEMBER 2016

Livability

There is no singular definition of the term "livability" as everyone values different aspects of urban living differently. We are using the term to refer to neighborhoods and communities that are walkable and provide transportation choices, good access to jobs and services, affordable housing, quality schools, parks and other public spaces, and safe streets, among other things. By design, they are generally more compact and pedestrian-oriented with a mix of uses. They support people of all ages. Livable communities value and invest in existing neighborhoods and amenities such as art, cultural heritage, and street and development designs that create a sense of place.

Downtown Rainier.

Complete Streets

Complete streets are streets that are designed, built, and operated to accommodate safe access for all users including pedestrians, bicyclists, transit riders, and motorists. Complete streets can look different between communities because the streets relate to their context and needs. A complete street in a highly urban environment may include bus lanes, wide sidewalks, bike lanes, median islands, and curb extensions whereas a complete street in a rural environment may have a separated path parallel to a roadway or a wide shoulder.

GOALS AND POLICIES

The development of the Regional Transportation Plan (RTP) 2050 began by developing a set of goals that represent overarching aspirational statements about desired outcomes that the region will always work towards achieving. A set of policies was then developed that support each goal. The goals and policies serve as the foundation for the plan. They will guide the selection of the projects included in the plan and the identification of the strategies and recommendations. The goals and policies will also be used by the MATPB as the basis for criteria used to select projects from the plan for funding with federal transportation funds the MATPB receives.

As part of continuing efforts to ensure coordination of regional land use and transportation planning, the MATPB has made certain that the policies developed for the RTP, particularly those related to land use development and environmental protection, are consistent with the amended goals and objectives adopted by the Capital Area Regional Planning Commission (CARPC) in 2008 for the regional land use plan.

Goal 1: Create Connected Livable Neighborhoods and Communities

Create interconnected livable places linked to jobs, services, schools, shops, and parks through a multi-modal transportation system that is integrated with the built environment and supports compact development patterns that increase the viability of walking, bicycling, and public transit.

Policies supporting this goal:

1. Coordinate land use, housing, and transportation planning and decision making to foster compact development patterns that provide transportation and affordable, accessible location-efficient housing choices.
2. Promote walkable, mixed-use neighborhoods.
3. Encourage growth in areas of existing development that place jobs, housing, and services closer together.
4. Encourage the concentration of higher density and mixed-use development in activity centers and along major transit corridors.
5. Enhance existing retail and employment centers in transit corridors by adding residential and other complementary land uses and

DRAFT SEPTEMBER 2016

access to daily activities.

9. Encourage transit-supportive land uses along existing and planned transit routes and use of transit-compatible site and street designs, where appropriate.
10. Utilize context sensitive transportation facility design that is a product of integrated land use and transportation planning and supports community character.

Goal 2: Improve Public Health, Safety, and Security

Design, build, operate, and maintain a transportation system that enables people to get where they need to go safely and that, combined with supportive land use patterns and site design, facilitates and encourages active lifestyles while improving air quality.

Policies supporting this goal:

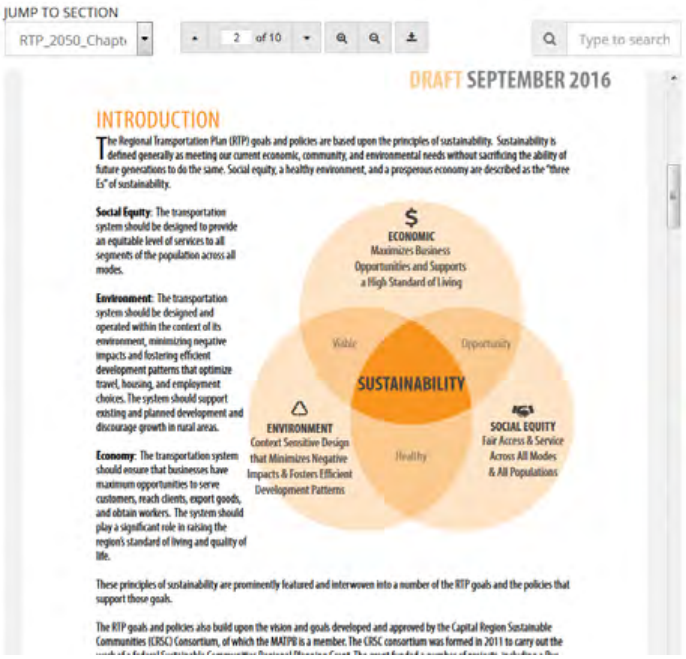
1. Address the safety and security of all users in planning, designing, building, operating, and maintaining the transportation system.
2. Retrofit existing transportation facilities that pose safety risks with safer, modern designs.
3. Seek to minimize conflicts between motorized and non-motorized traffic through lower roadway speeds where appropriate, provision of safe and convenient street crossings, and other means.
4. Support education and research programs and law enforcement efforts to improve safety for all transportation users, focusing on behaviors resulting in the greatest risk of serious crashes, including driving while impaired, distracted driving (in particular texting), and aggressive driving.
5. Encourage mixed-use development and street designs with vibrant public spaces that support a culture of walking, bicycling, use of transit, and social interaction.
6. Prioritize active transportation facility improvements that will improve access to jobs, schools, healthy food, and other destinations that meet daily needs and those located in areas with health disparities and under-served populations.
7. Promote and facilitate active transportation for short trips, including maintenance of active transportation facilities to ensure year-round availability.

Transit Compatible Site and Street Designs

Transit compatible site designs are development configurations that enable convenient access to and from bus routes by minimizing walking distances, providing appropriate densities to support transit ridership, and providing a safe and comfortable boarding and alighting experience. Walkability is key because most transit trips begin and end with walking.

Transit compatible street designs use urban design coupled with street features that encourage safe traffic speeds and prioritize space for pedestrians, bicyclists, and transit. This could include adding bus-only lanes or installing bus bulbs for boarding and alighting as well as providing facilities that make walking or biking to or from stops easier, safer, and more enjoyable. This includes provision of frequent crossing opportunities.

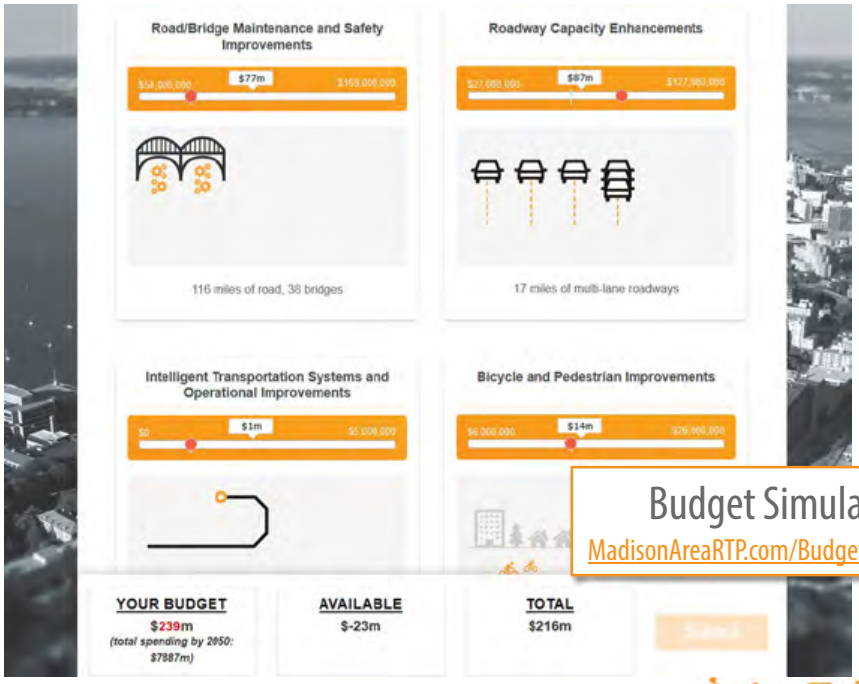
WEBSITE UPDATED, NEW TOOLS LAUNCHED





Draft Plan Review
CiviComment.MadisonAreaRTP.com

WEBSITE UPDATED, NEW TOOLS LAUNCHED



Budget Simulator
MadisonAreaRTP.com/Budget-Simulator

WEBSITE UPDATED, NEW TOOLS LAUNCHED



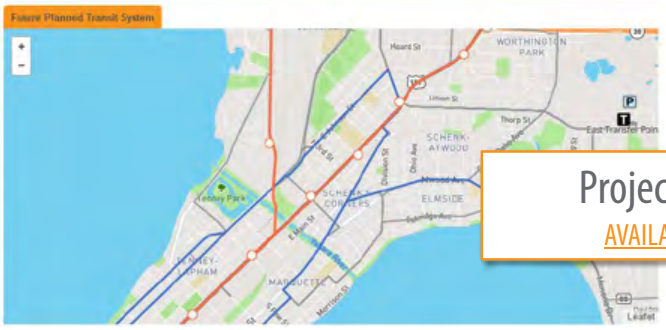
Metro Transit, an award-winning public transportation system owned and operated by the City of Madison, provides the majority of public transportation service in the Madison metropolitan area. Public transportation is an attractive alternative to driving alone to work, school, and other destinations. The Madison area consistently ranks highly in terms of ridership per capita.

Planning for the future of public transportation is challenging. Metro's bus storage and maintenance facility is over capacity and we will need a new facility and new vehicles for any new service during peak periods. Ridership grew for about 15 years and is now showing signs of decline, but overcrowding on buses remains a concern. Bus rapid transit can substantially reduce travel times, increase capacity, and attract new ridership. A new high quality inter-city bus terminal is needed for passengers travelling to Milwaukee, Chicago, Minneapolis/St Paul, and other destinations.

Key public transit recommendations include:

- Implementing bus rapid transit in the east-west and north-south corridor
- Increasing service frequency on urban streets in central Madison
- Adding all-day service in developing and planned neighborhoods
- Adding express regional commuter service to suburban communities

Map Area





Project Review
AVAILABLE SOON!

15

FACILITY NEEDS AND RECOMMENDATIONS

- Staff has identified facility needs and developed transit and bicycle recommendations based on:
  - Analysis of existing conditions, including congestion, safety, and gaps/barriers in the pedestrian and bicycle networks
  - Other previous and ongoing planning efforts
  - Forecasting future travel based on projected growth
  - The community mapping tool
  - Public involvement
  - Feedback from policy makers and stakeholders

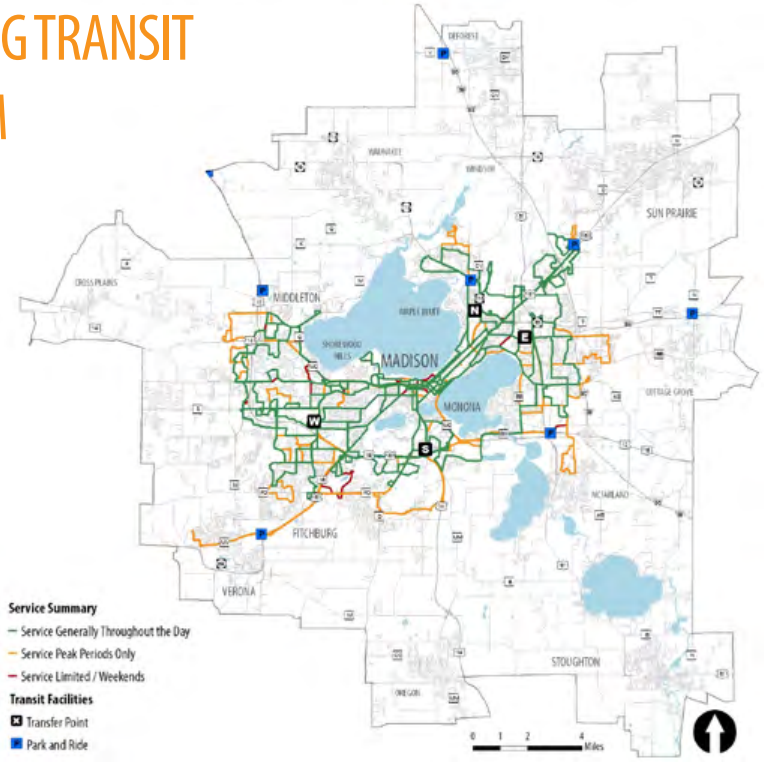
16

PUBLIC TRANSPORTATION



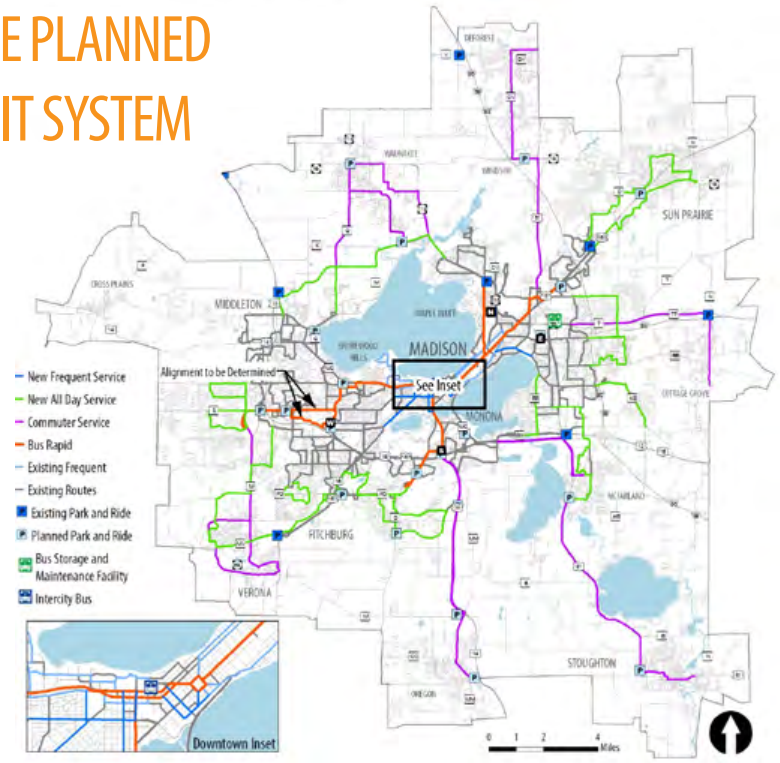
17

EXISTING TRANSIT SYSTEM



18

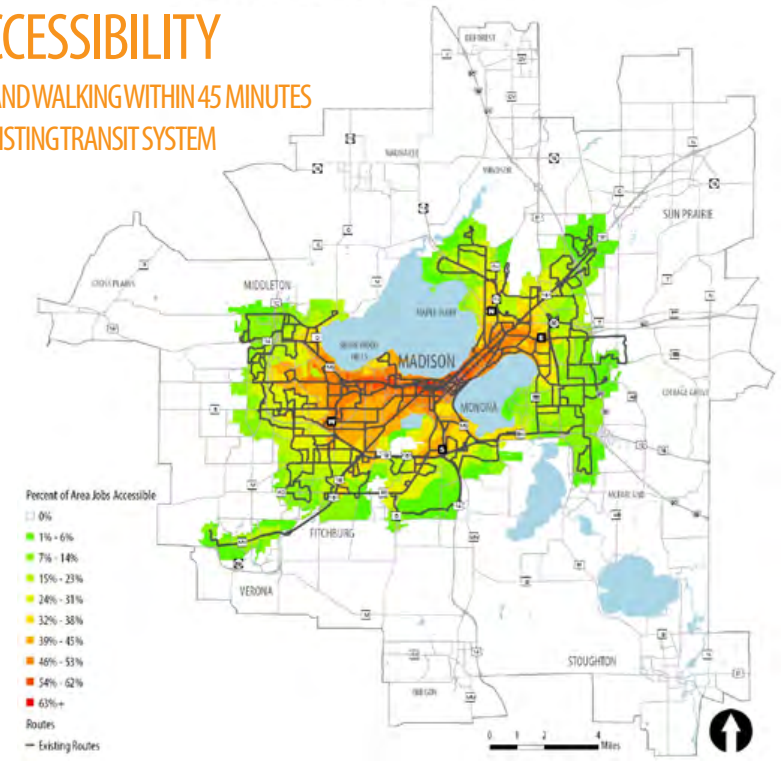
FUTURE PLANNED TRANSIT SYSTEM



19

JOB ACCESSIBILITY

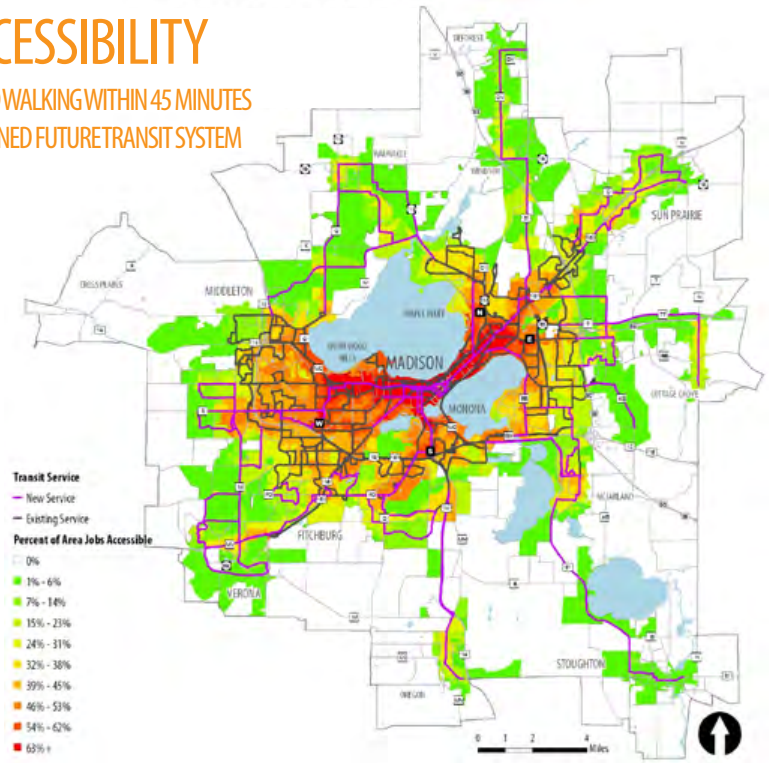
BY TRANSIT AND WALKING WITHIN 45 MINUTES USING THE EXISTING TRANSIT SYSTEM



20

JOB ACCESSIBILITY

BY TRANSIT AND WALKING WITHIN 45 MINUTES
USING THE PLANNED FUTURE TRANSIT SYSTEM



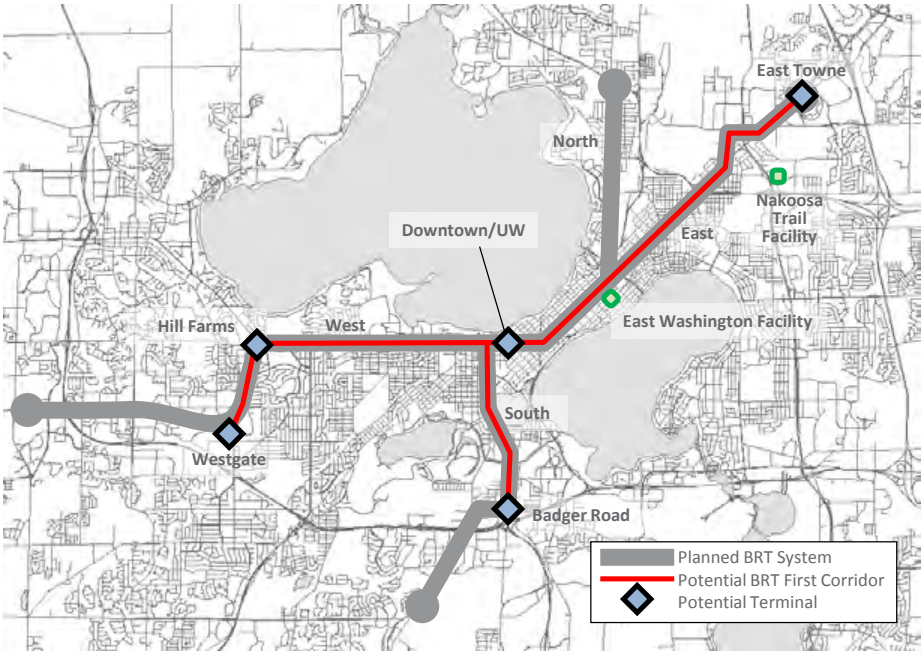
21

BUS RAPID TRANSIT IMPLEMENTATION NEXT STEPS

- Identification of first phase project
  - Criteria to include ridership potential, cost, equity analysis, public input
- Analysis of roadway changes and traffic operational issues
- Ridership and cost estimates
- FTA Small Starts project development phase (final design)
- Nakoosa Trail bus garage opened
- Construction and procurement
- Revenue service in 2020-2022
- System expansion with new regional funding and governance structure

22

BUS RAPID TRANSIT IMPLEMENTATION



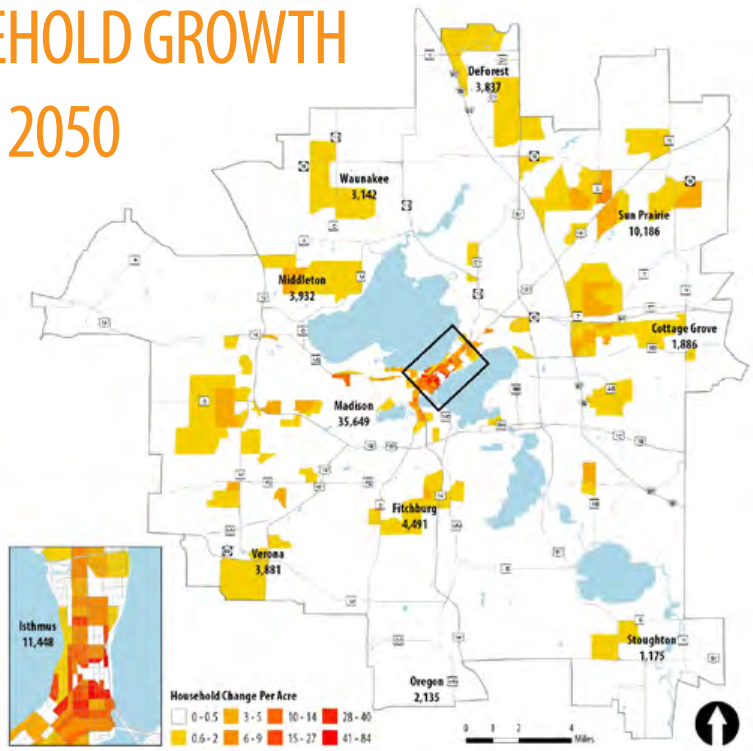
23

TRAVEL FORECASTS

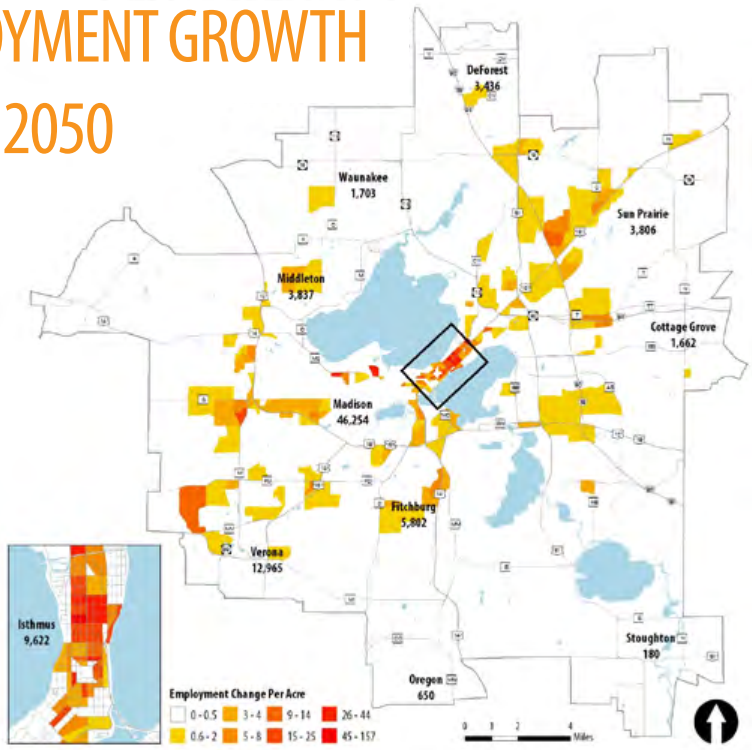


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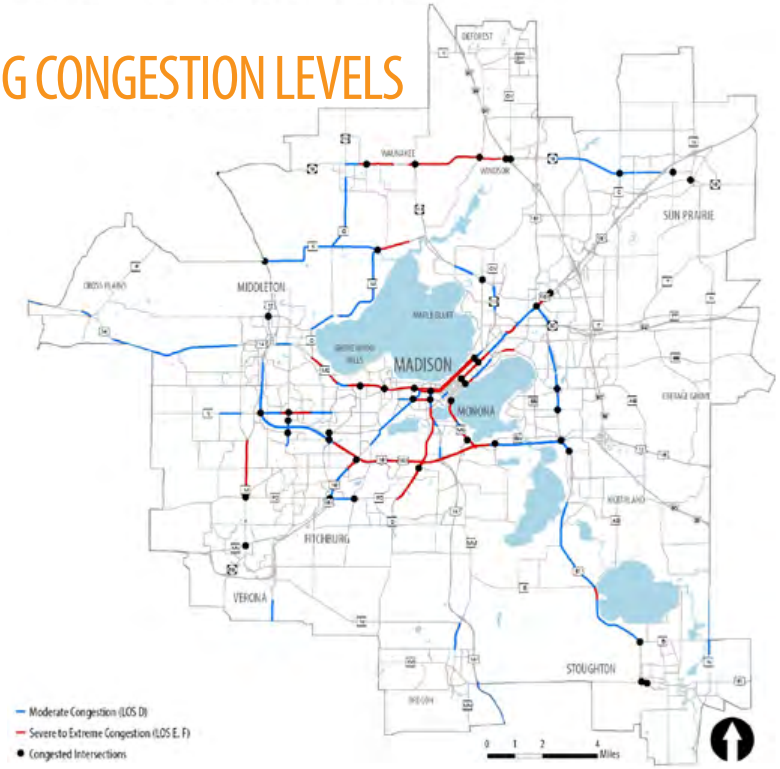
HOUSEHOLD GROWTH 2010 - 2050



EMPLOYMENT GROWTH 2010 - 2050



EXISTING CONGESTION LEVELS

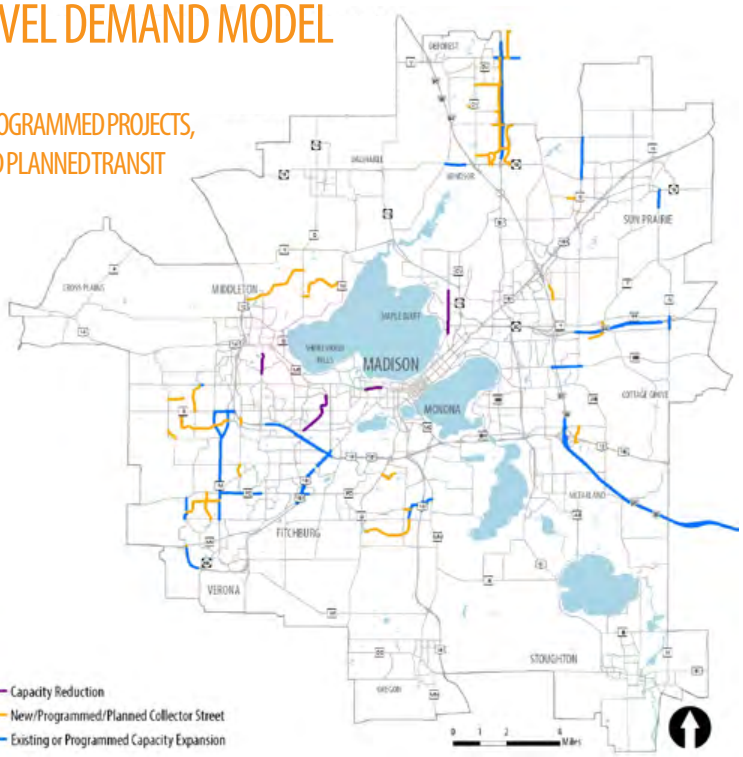


27

2050 TRAVEL DEMAND MODEL

SCENARIO 1

EXISTING AND PROGRAMMED PROJECTS, COLLECTORS, AND PLANNED TRANSIT

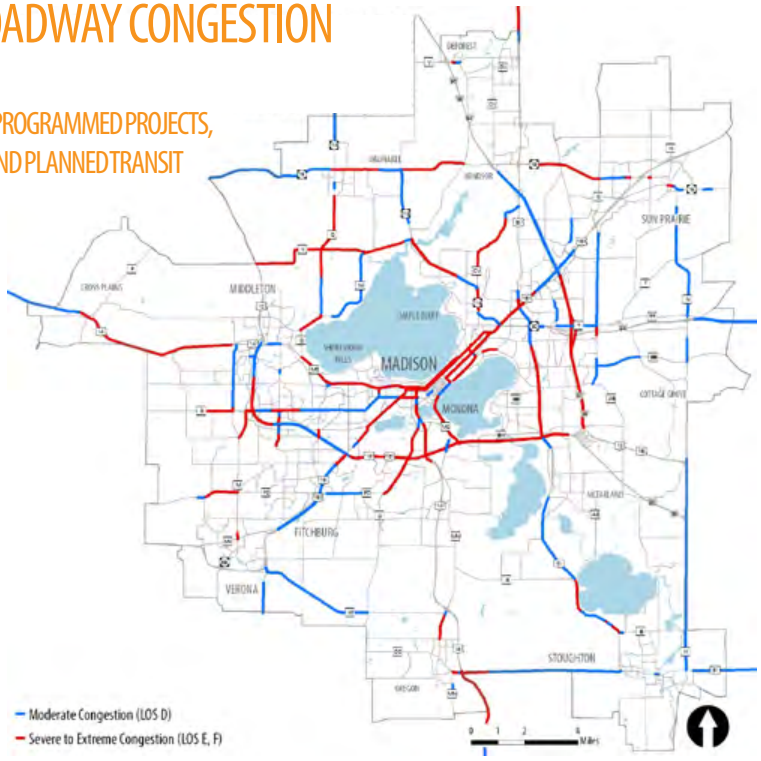


28

2050 ROADWAY CONGESTION

SCENARIO 1

EXISTING AND PROGRAMMED PROJECTS, COLLECTORS, AND PLANNED TRANSIT



29

2050 TRANSIT RIDERSHIP FORECAST

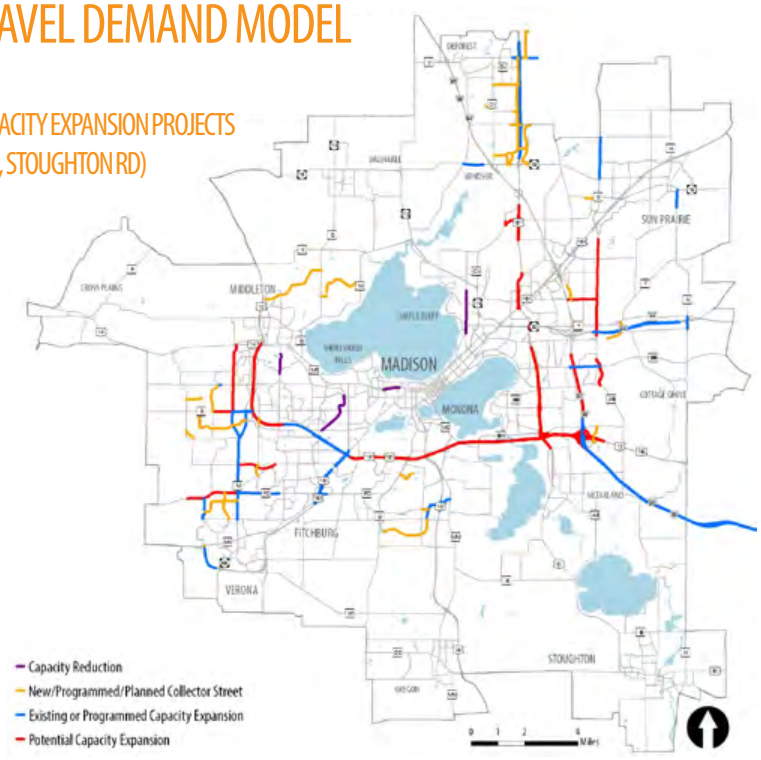
- Base Year: 42,500 boardings and 37,500 linked trips
  - Transfer rate of 13%
- 2050: 92,000 boardings and 73,000 linked trips
  - BRT: 27, 500 boardings
  - Transfer rate of 26%
- Excludes supplemental school service
- Note: Forecast is preliminary as a few remaining refinements are being made to the mode choice/transit components of the travel model

30

2050 TRAVEL DEMAND MODEL

SCENARIO 2

POTENTIAL CAPACITY EXPANSION PROJECTS (INCL. BELTLINE, STOUGHTON RD)

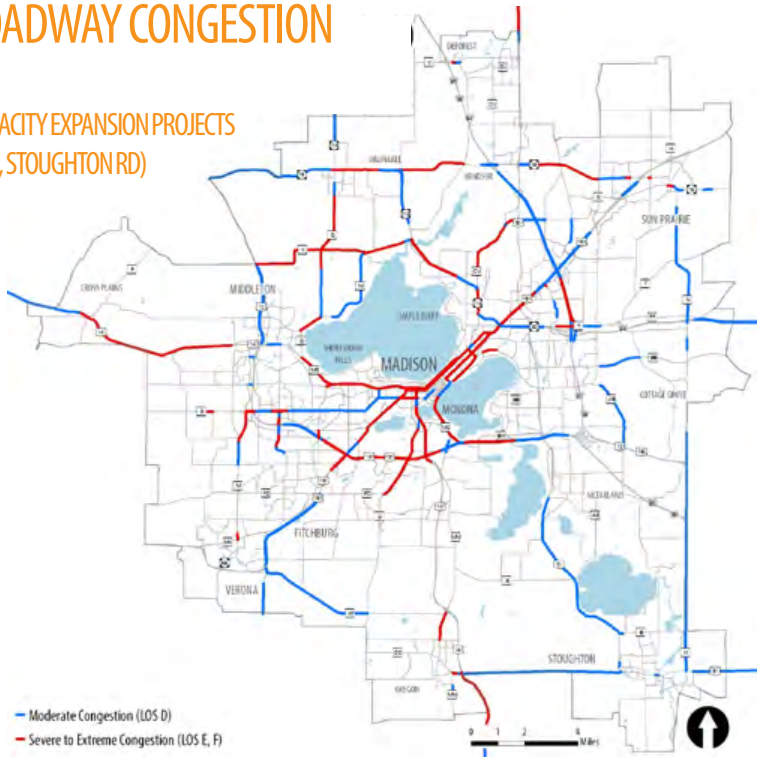


31

2050 ROADWAY CONGESTION

SCENARIO 2

POTENTIAL CAPACITY EXPANSION PROJECTS (INCL. BELTLINE, STOUGHTON RD)

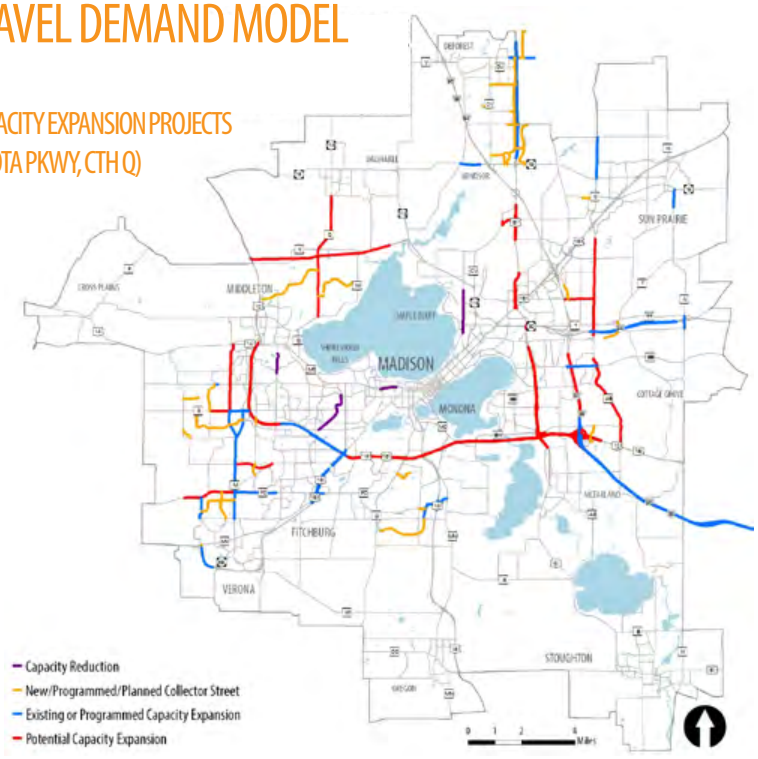


32

2050 TRAVEL DEMAND MODEL

SCENARIO 3

POTENTIAL CAPACITY EXPANSION PROJECTS (INCL. N MENDOTA PKWY, CTH Q)

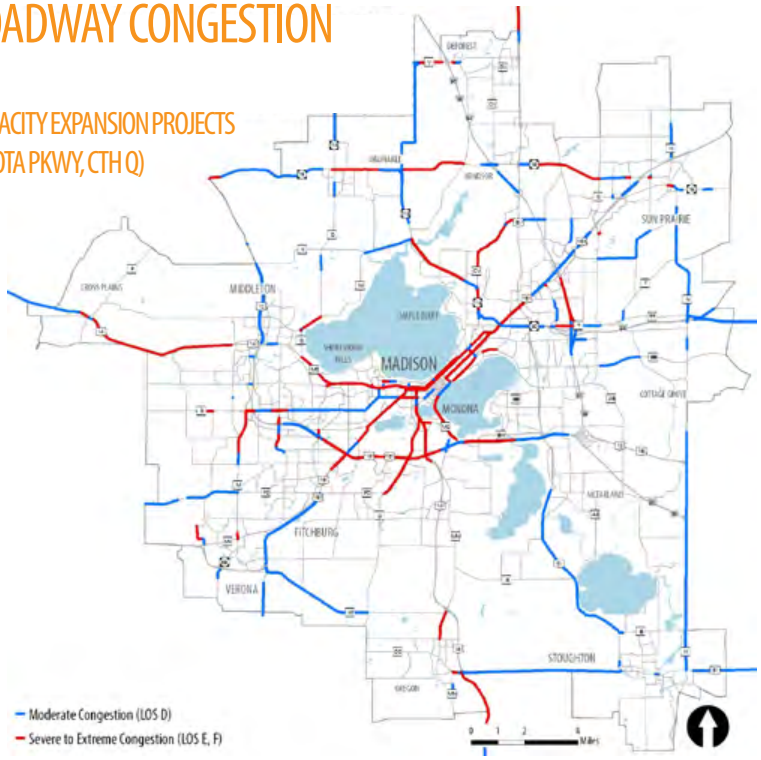


33

2050 ROADWAY CONGESTION

SCENARIO 3

POTENTIAL CAPACITY EXPANSION PROJECTS (INCL. N MENDOTA PKWY, CTH Q)



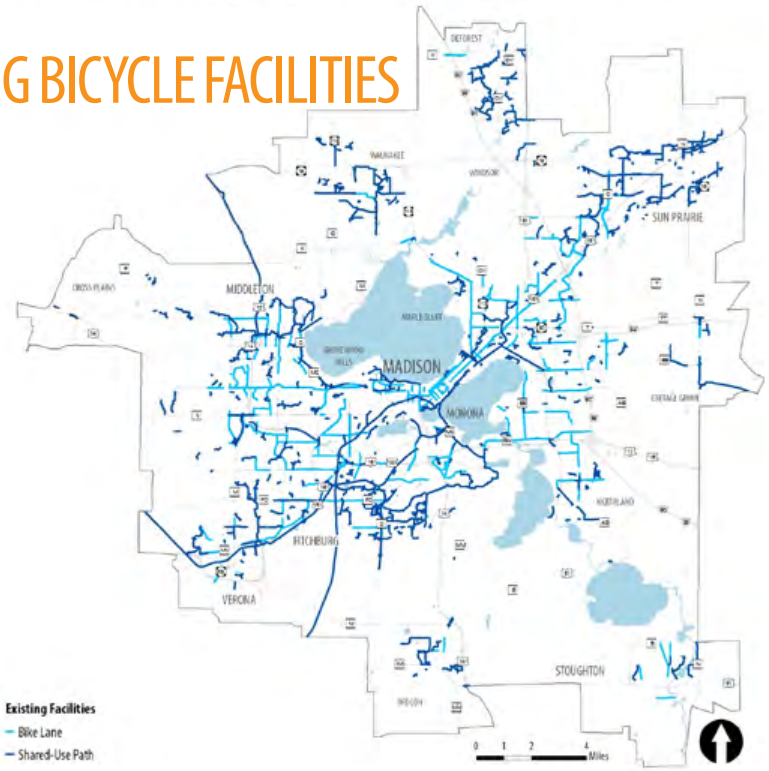
34

BICYCLE TRANSPORTATION



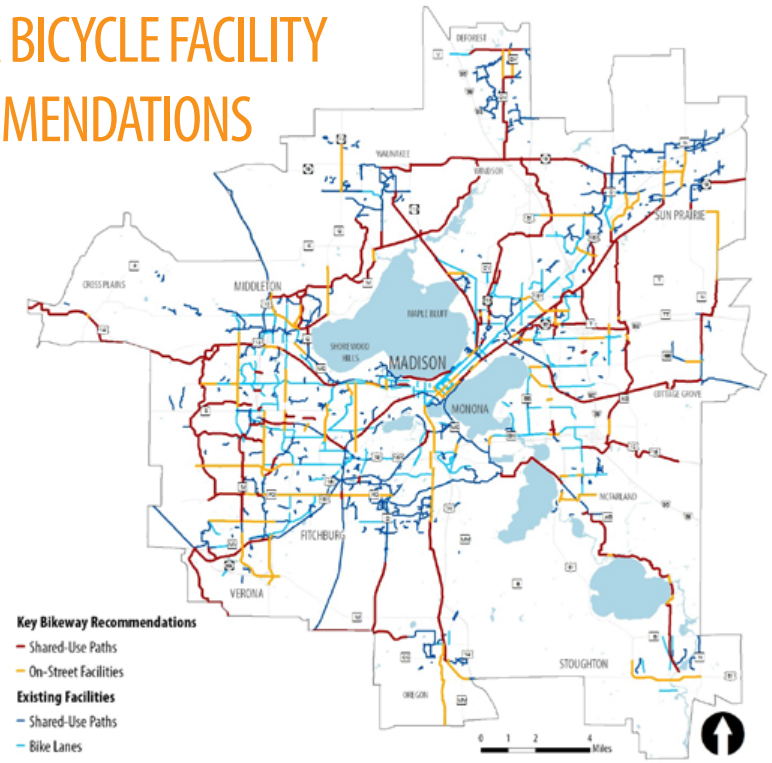
35

EXISTING BICYCLE FACILITIES

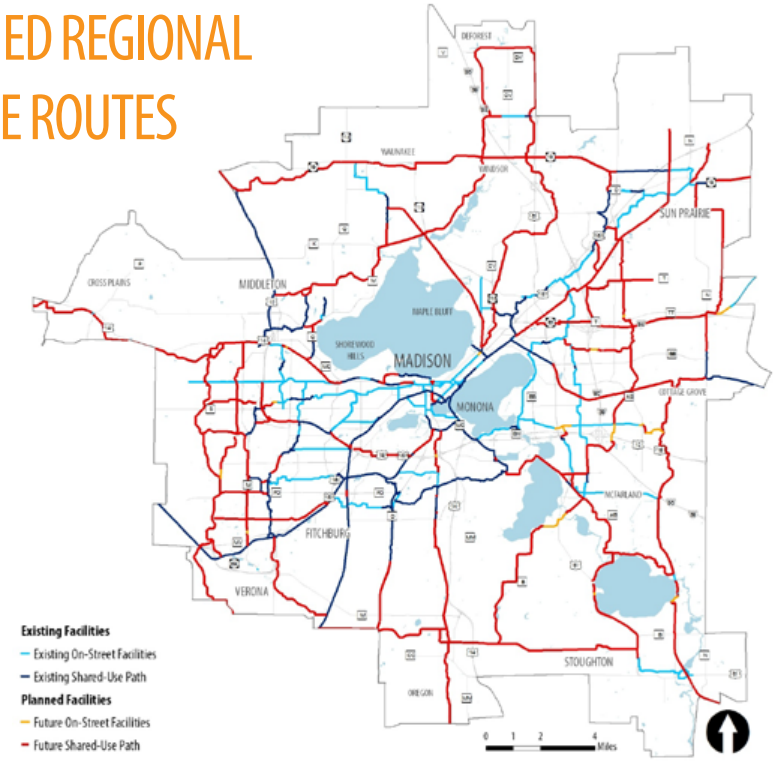


36

MAJOR BICYCLE FACILITY RECOMMENDATIONS



PLANNED REGIONAL BICYCLE ROUTES

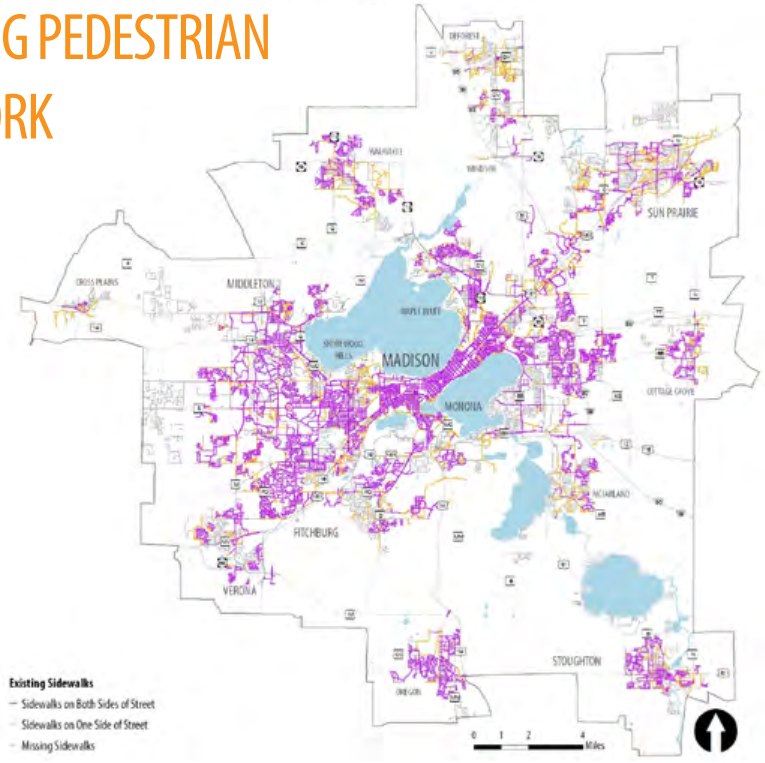


PEDESTRIAN TRANSPORTATION



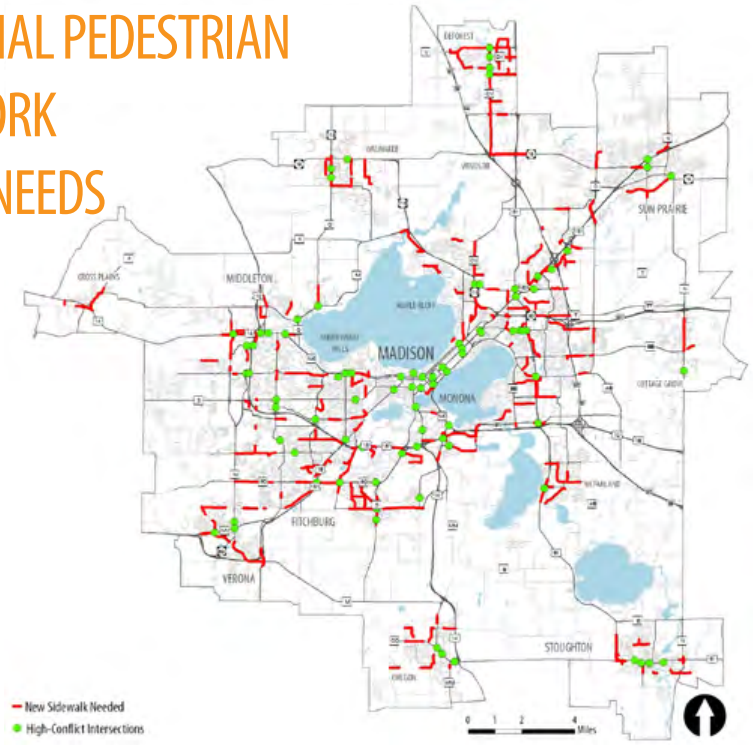
39

EXISTING PEDESTRIAN NETWORK



40

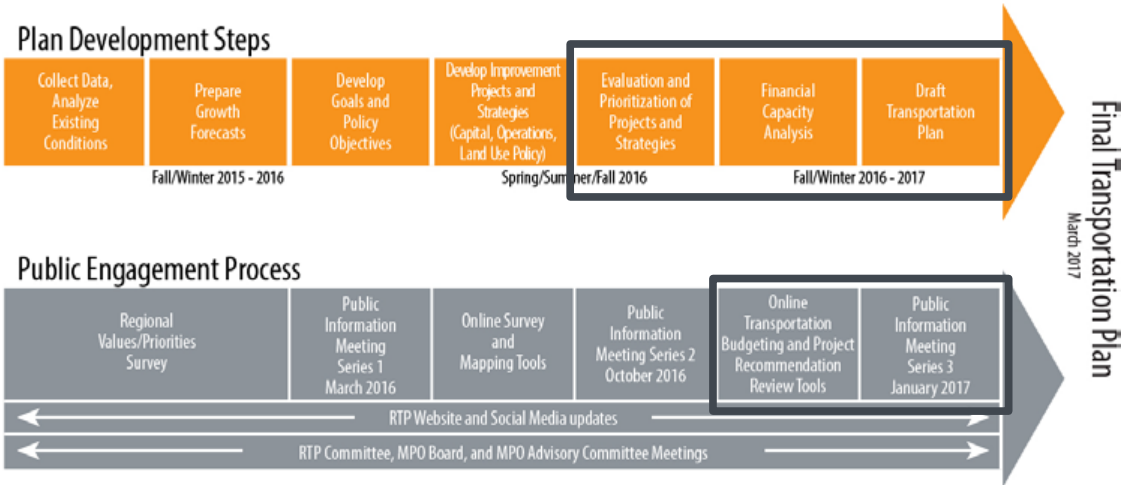
REGIONAL PEDESTRIAN NETWORK TIER 1 NEEDS



41

NEXT STEPS

Regional Transportation Plan Process and Schedule



42

TONIGHT'S ACTIVITY – TABLE MAPPING

Each table has a set of maps containing the potential and planned projects just presented for each mode. We want your feedback on the projects we've identified and any others you think should be considered.

- Green means that you agree with the project.
- Yellow means that you have reservations about the project.
- Red means that you would like the project to be removed.
- Use Blue for projects that you think we missed. Describe the project.

You may add dots to the online community map later if you miss a project or think of additional feedback at a later time.

WANT MORE INFORMATION?

Madison Area Transportation Planning Board

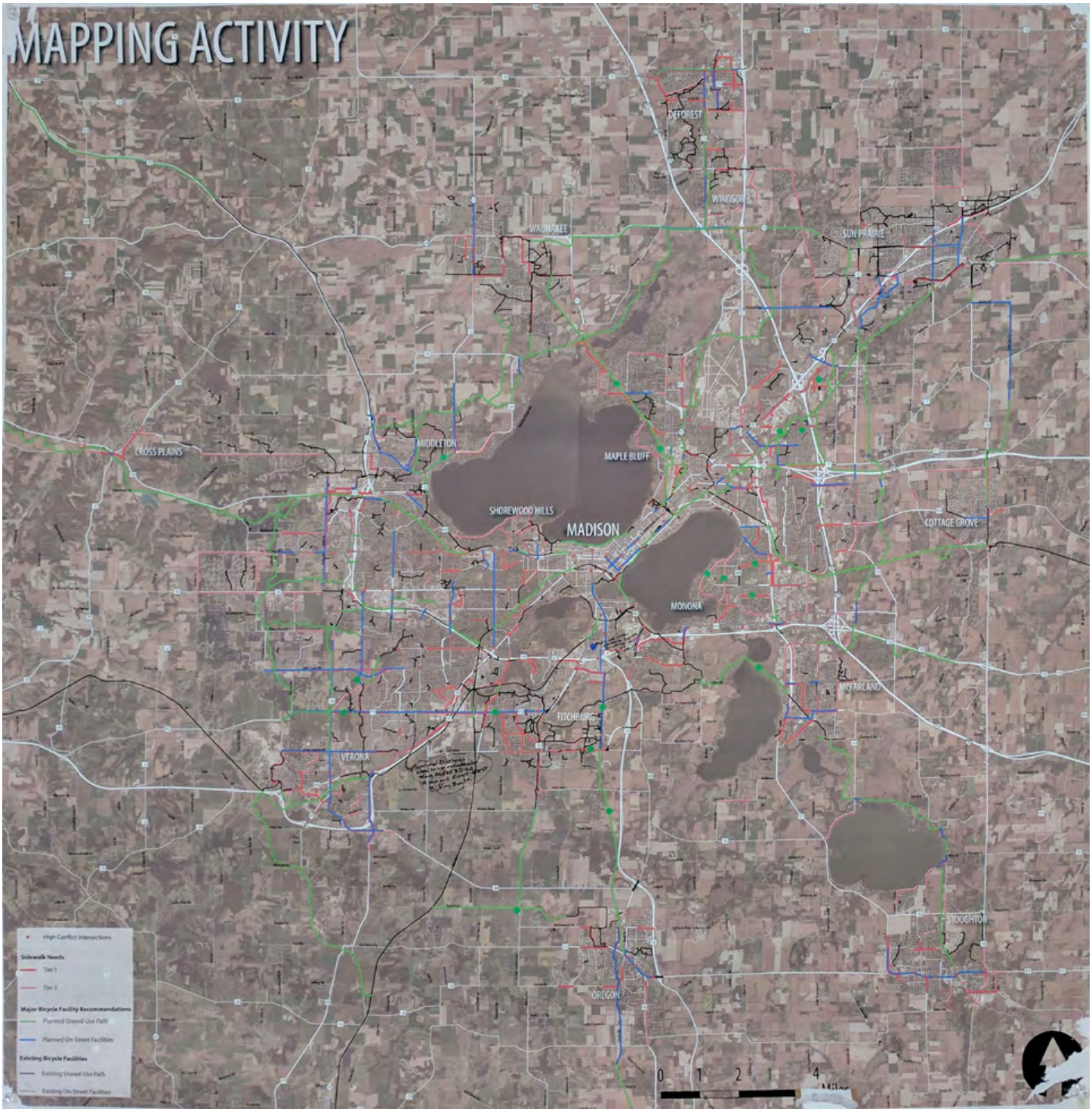
www.madisonareampo.org

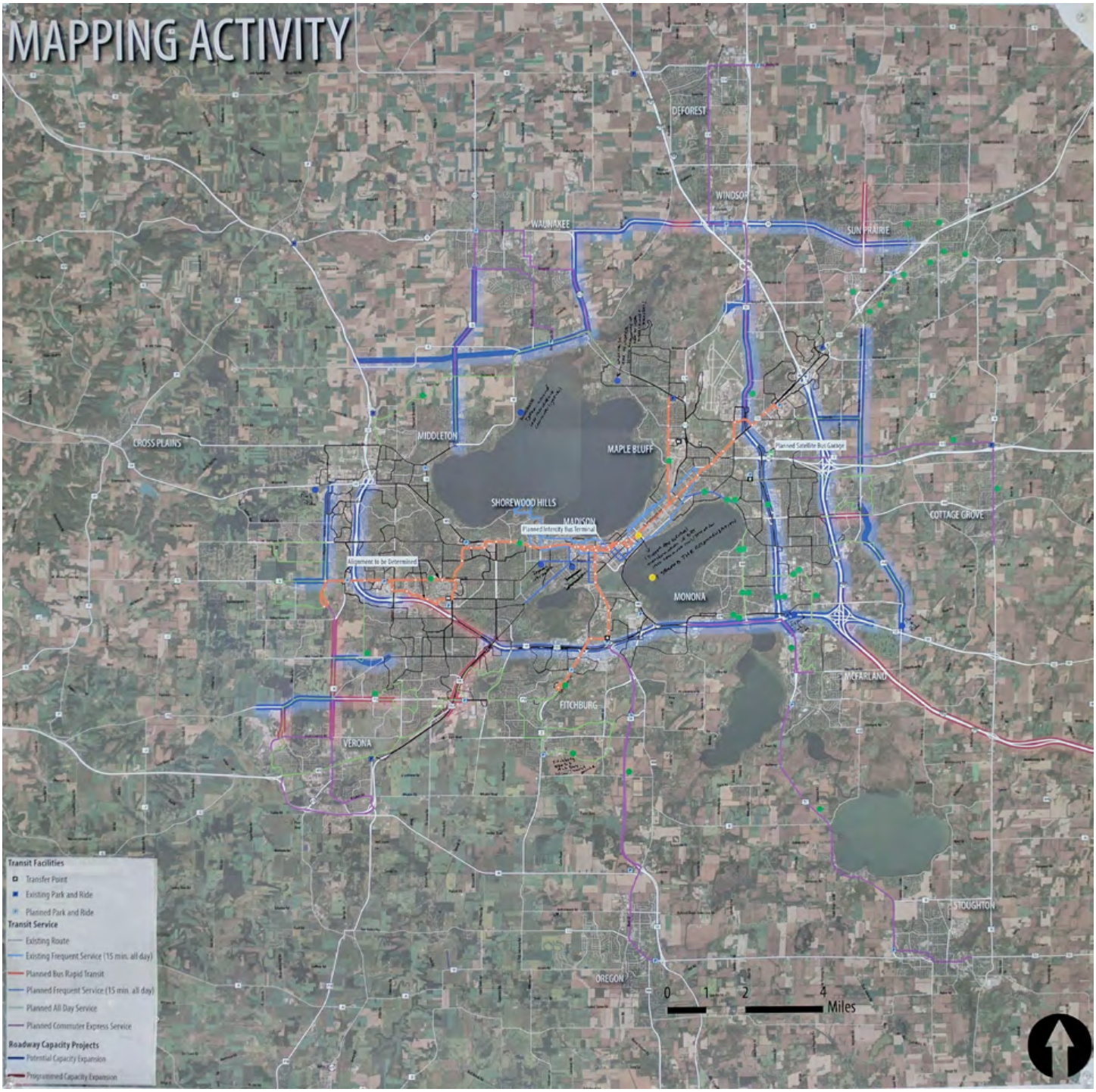
2050 Regional Transportation Plan

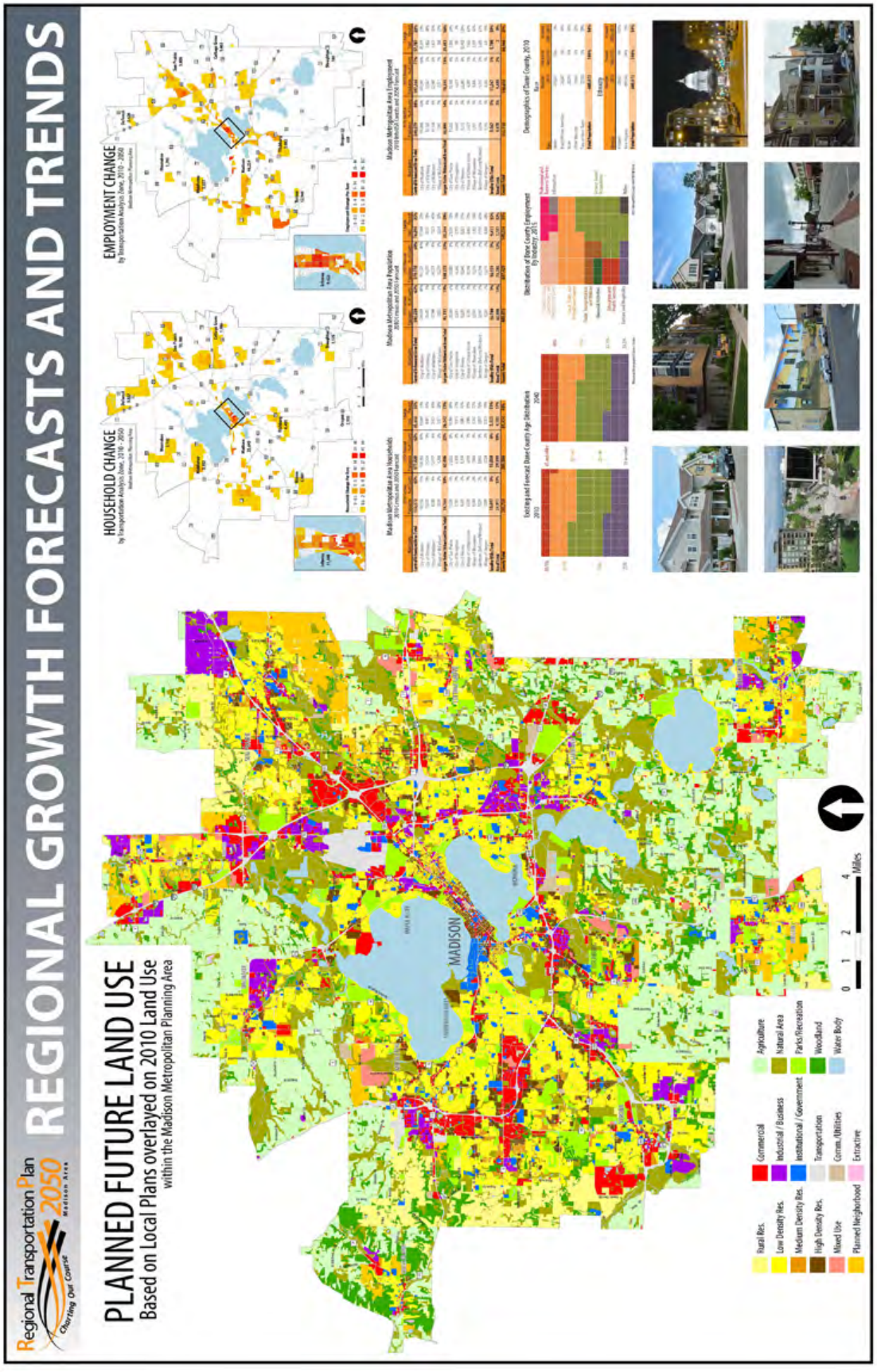
www.madisonareartp.com

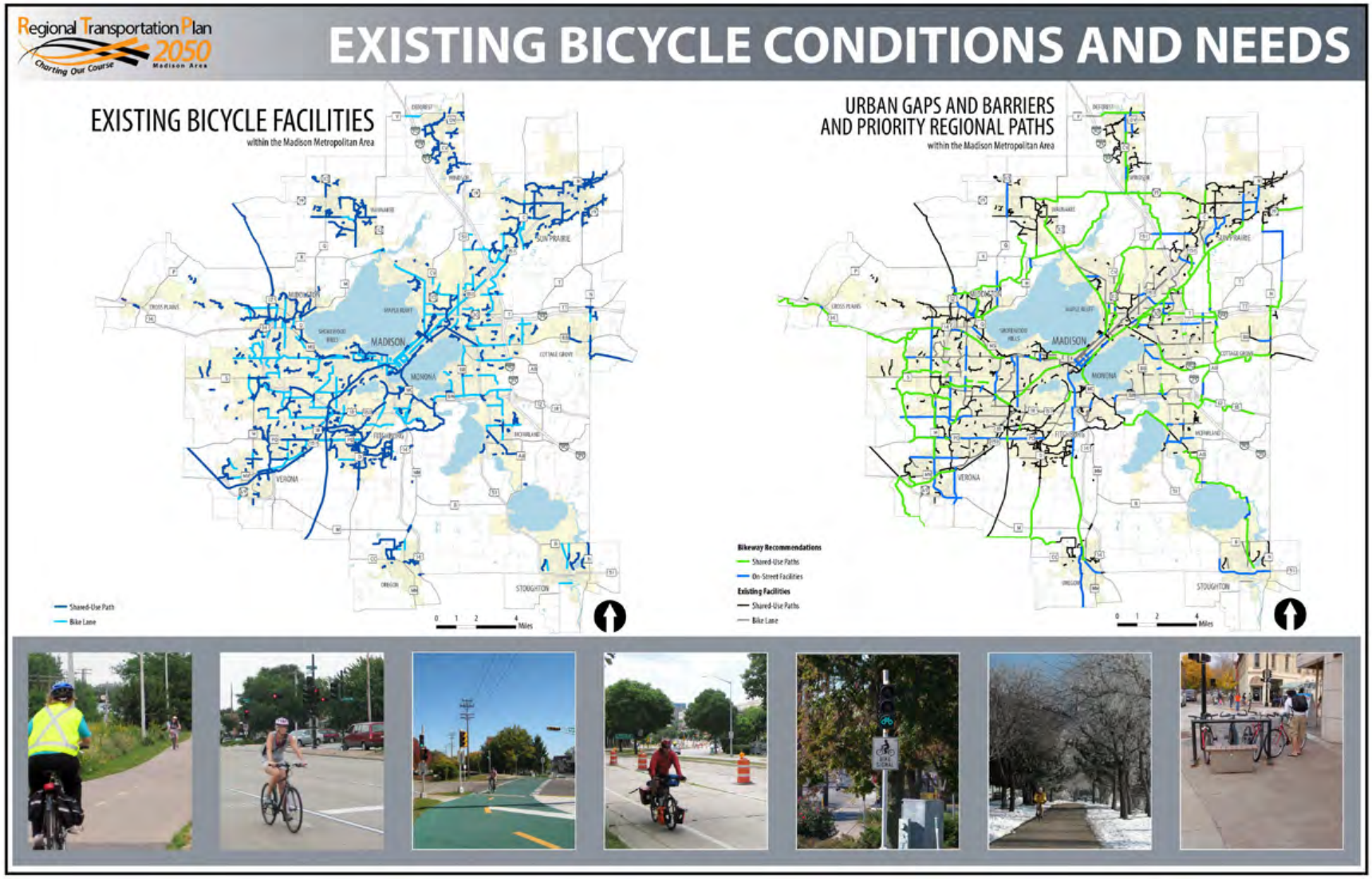
Regional Transportation Plan 2050 Madison Area

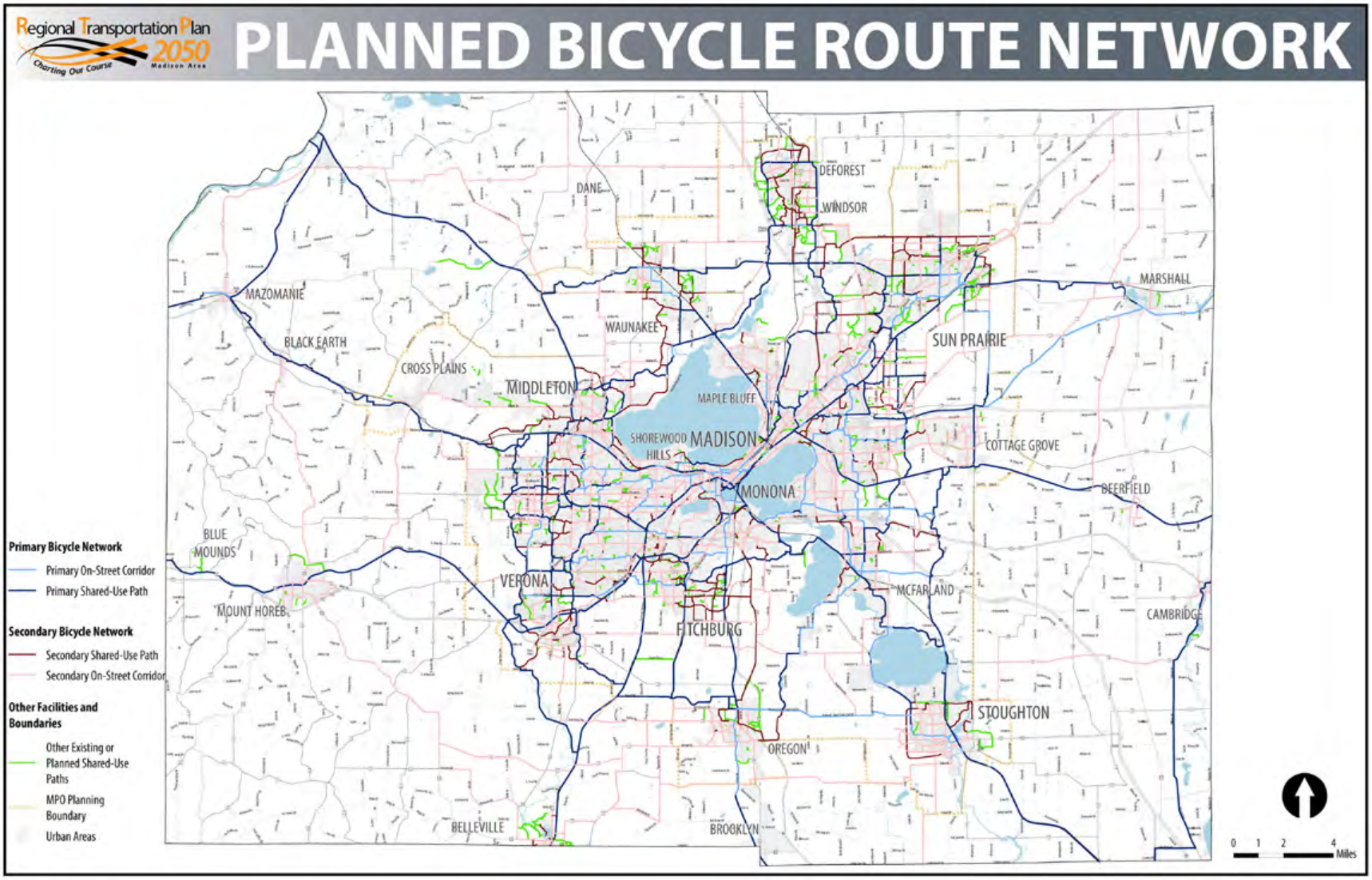
Charting Our Course


MAPPING ACTIVITY
DEFOREST
WINDSOR
WAUNAKEE
SUN PRAIRIE
CROSS PLAINS
MIDDLETON
MAPLE BLUFF
SHOREWOOD HILLS
MADISON
COTTAGE GROVE
MONONA
MCFARLAND
FITCHBURG
VERONA
STOUGHTON
OREGON
High Conflict Intersections
Sidewalk Needs
Tier 1
Tier 2
Major Bicycle Facility Recommendations
Planned Shared-Use Path
Planned On-Street Facilities
Existing Bicycle Facilities
Existing Shared-Use Path
Existing On-Street Facilities
0 1 2 4
Miles

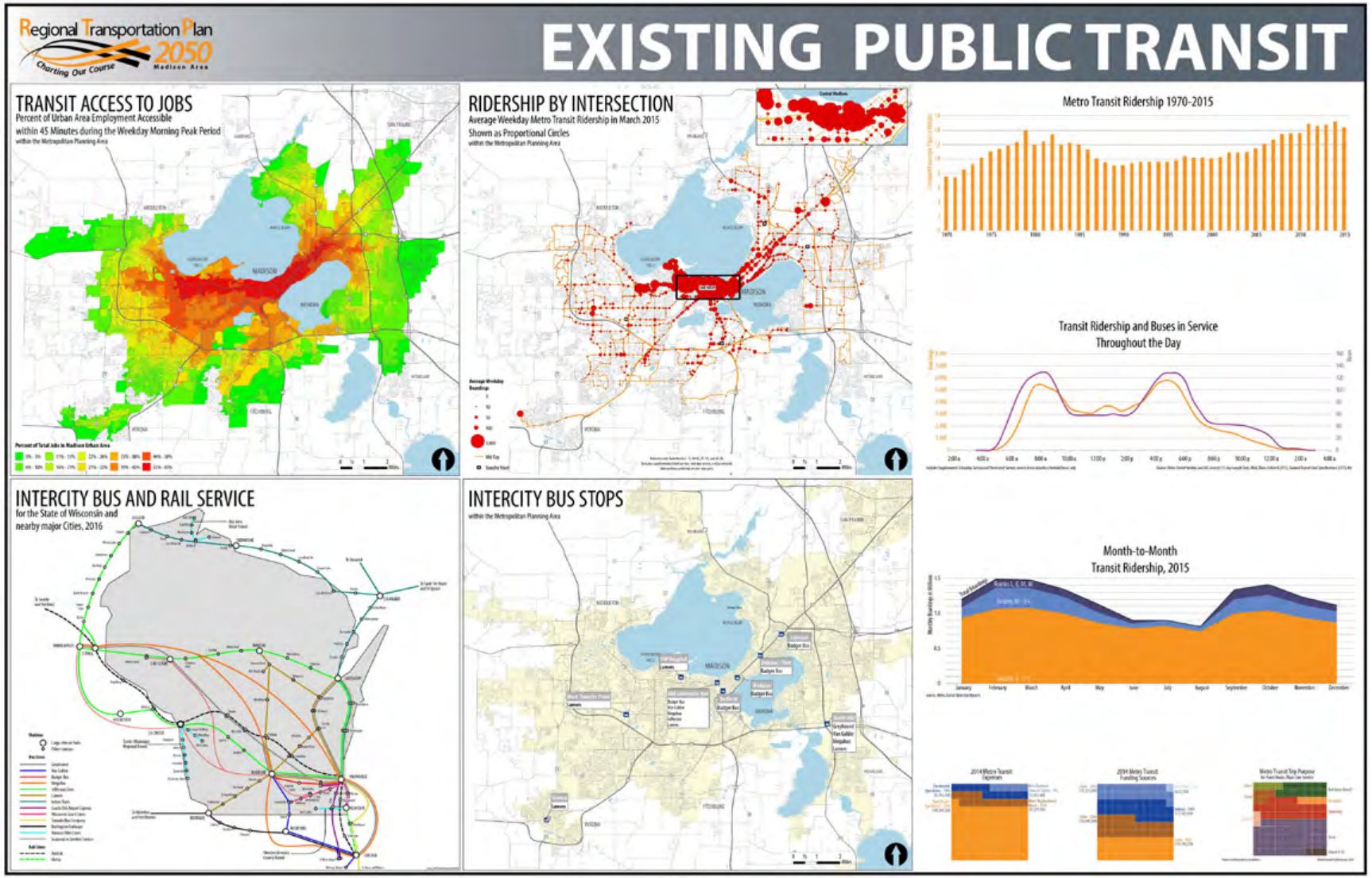

MAPPING ACTIVITY
DEFOREST
WINDSOR
WAUNAKEE
SUN PRAIRIE
CROSS PLAINS
MIDDLETON
MAPLE BLUFF
SHOREWOOD HILLS
MADISON
COTTAGE GROVE
MONONA
MCFARLAND
FITCHBURG
VERONA
STOUGHTON
OREGON
Transit Facilities
Transfer Point
Existing Park and Ride
Planned Park and Ride
Transit Service
Existing Route
Existing Frequent Service (15 min. all day)
Planned Bus Rapid Transit
Planned Frequent Service (15 min. all day)
Planned All Day Service
Planned Commuter Express Service
Roadway Capacity Projects
Potential Capacity Expansion
Programmed Capacity Expansion
0 1 2 4
Miles


Regional Transportation Plan 2050
REGIONAL GROWTH FORECASTS AND TRENDS
PLANNED FUTURE LAND USE
Based on Local Plans overlayed on 2010 Land Use
within the Madison Metropolitan Planning Area
EMPLOYMENT CHANGE
HOUSEHOLD CHANGE
MADISON
Agriculture
Natural Area
Parks/Recreation
Woodland
Water Body
Commercial
Industrial / Business
Institutional / Government
Transportation
Comm./Utilities
Extractive
Rural Res.
Low Density Res.
Medium Density Res.
High Density Res.
Mixed Use
Planned Neighborhood
Miles


Regional Transportation Plan 2050
Charting Our Course
Madison Area
EXISTING BICYCLE CONDITIONS AND NEEDS
EXISTING BICYCLE FACILITIES
within the Madison Metropolitan Area
Shared-Use Path
Bike Lane
0 1 2 4 Miles
URBAN GAPS AND BARRIERS AND PRIORITY REGIONAL PATHS
within the Madison Metropolitan Area
Bikeway Recommendations
Shared-Use Paths
On-Street Facilities
Existing Facilities
Shared-Use Paths
Bike Lane
0 1 2 4 Miles


Regional Transportation Plan 2050
Charting Our Course
Madison Area
PLANNED BICYCLE ROUTE NETWORK
DANE
DEFOREST
WINDSOR
MARSHALL
MAZOMANIE
BLACK EARTH
WAUNAKEE
SUN PRAIRIE
CROSS PLAINS
MIDDLETON
MAPLE BLUFF
SHOREWOOD HILLS
MADISON
COTTAGE GROVE
MONONA
DEERFIELD
BLUE MOUNDS
VERONA
MCFARLAND
CAMBRIDGE
MOUNT HOREB
FITCHBURG
STOUGHTON
OREGON
BELLEVILLE
BROOKLYN
Primary Bicycle Network
Primary On-Street Corridor
Primary Shared-Use Path
Secondary Bicycle Network
Secondary Shared-Use Path
Secondary On-Street Corridor
Other Facilities and Boundaries
Other Existing or Planned Shared-Use Paths
MPO Planning Boundary
Urban Areas
0 1 2 4
Miles

Regional Transportation Plan 2050
Charting Our Course
EXISTING PEDESTRIAN NETWORK AND NEEDS
EXISTING SIDEWALKS
within the Madison Metropolitan Area
REGIONAL PEDESTRIAN NEEDS
within the Madison Metropolitan Area
MADISON
VERONA
STOUGHTON
FITCHBURG
MIDDLETON
SUN PRAIRIE
MONONA
WAUNAKEE
Existing Sidewalks
Sidewalks on Both Sides of Street
Sidewalks on One Side of Street
Missing Sidewalks
High-Conflict Intersections
Sidewalk Needs*
Sidewalk Needed - Priority 1
Sidewalk Needed - Priority 2
Walk Access Score **
Weighted by population to reflect pedestrian travel demand
21 - 30
31 - 40
41 - 55
56 - 70
71 - 100
0 1 2 4 Miles

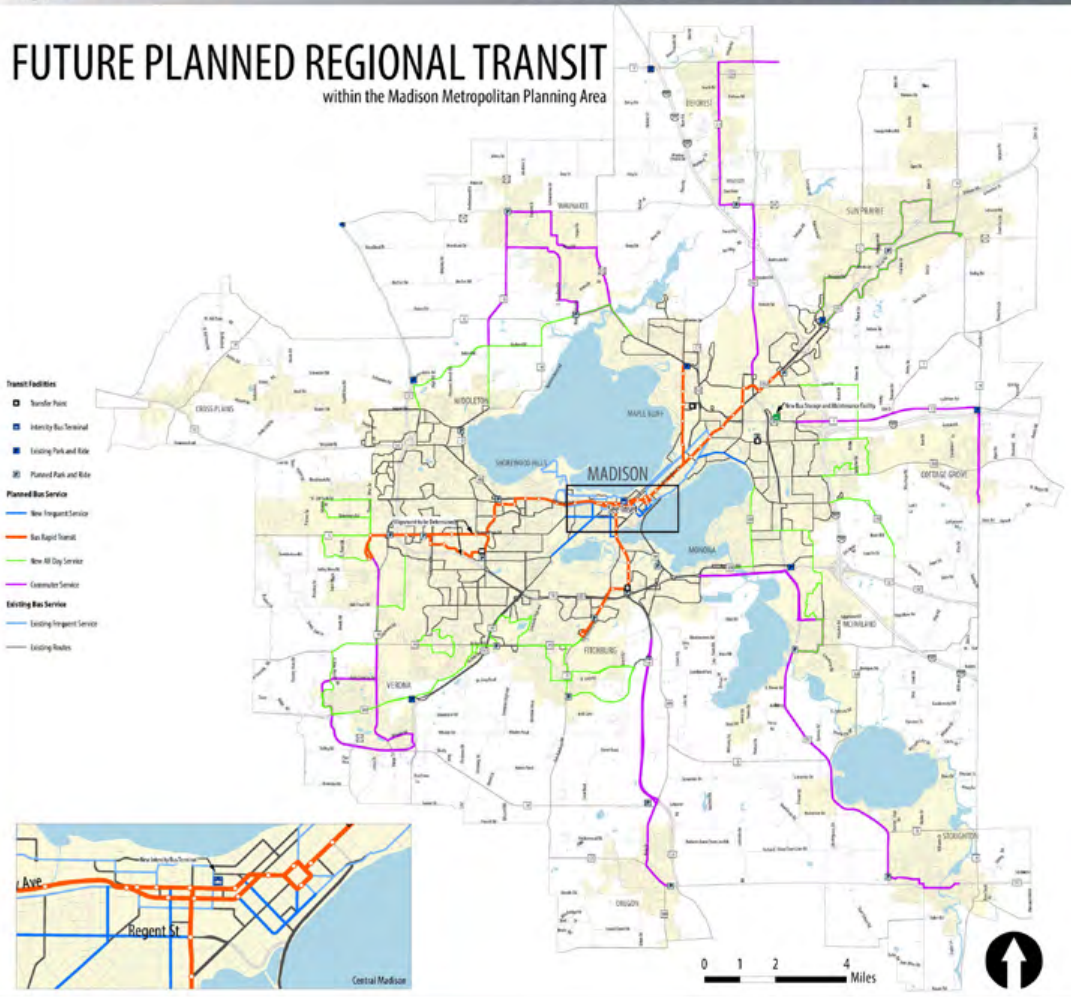

Regional Transportation Plan 2050
Madison Area
Charting Our Course
EXISTING PUBLIC TRANSIT
TRANSIT ACCESS TO JOBS
Percent of Urban Area Employment Accessible
within 45 Minutes during the Weekday Morning Peak Period
RIDERSHIP BY INTERSECTION
Average Weekday Metro Transit Ridership in March 2015
Shown as Proportional Circles
Metro Transit Ridership 1970-2015
Transit Ridership and Buses in Service
Throughout the Day
INTERCITY BUS AND RAIL SERVICE
for the State of Wisconsin and
nearby major Cities, 2016
INTERCITY BUS STOPS
Month-to-Month
Transit Ridership, 2015

Regional Transportation Plan 2050 Madison Area
Charting Our Course

TRANSIT RECOMMENDATIONS

FUTURE PLANNED REGIONAL TRANSIT

within the Madison Metropolitan Planning Area





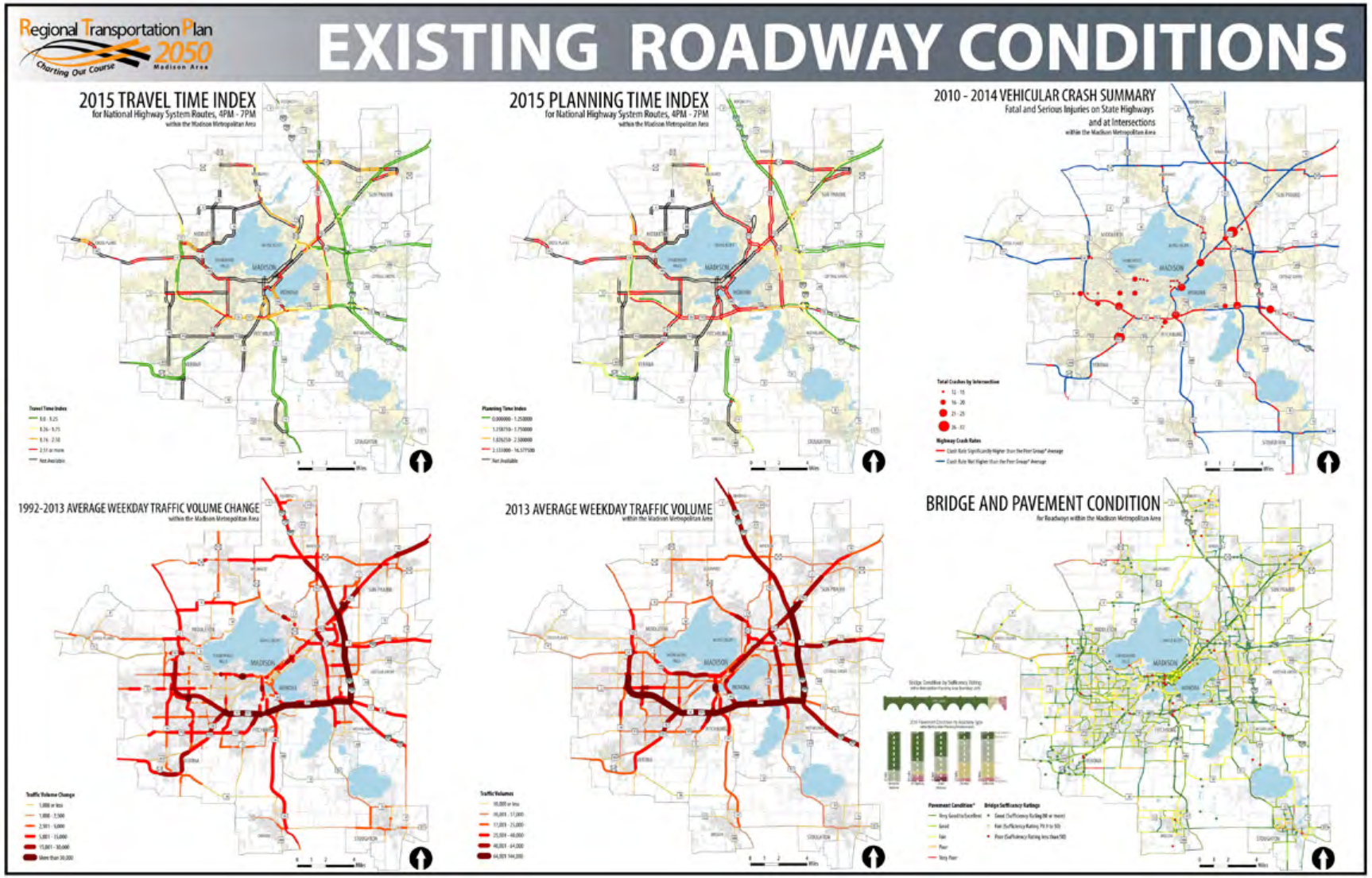




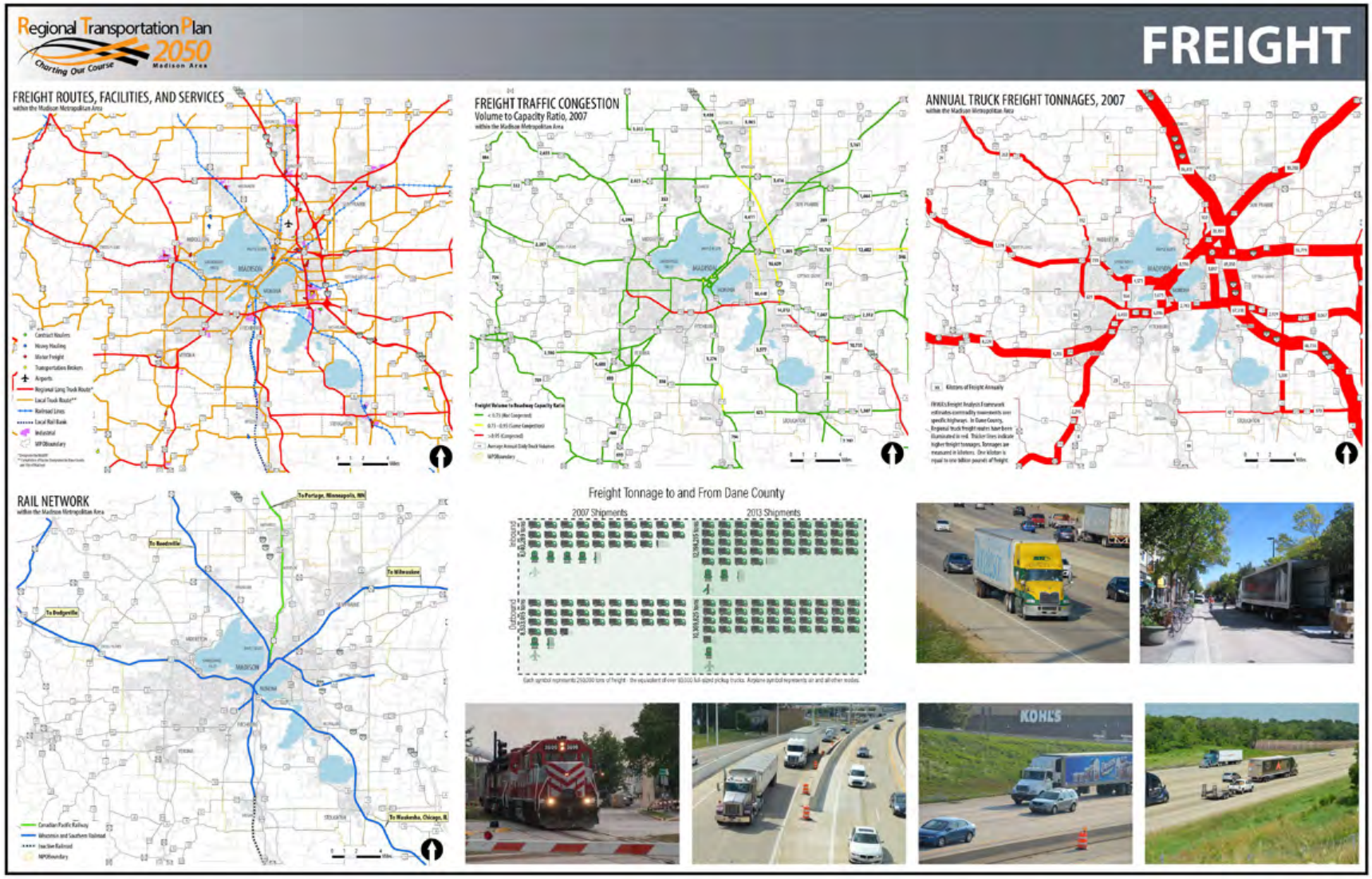


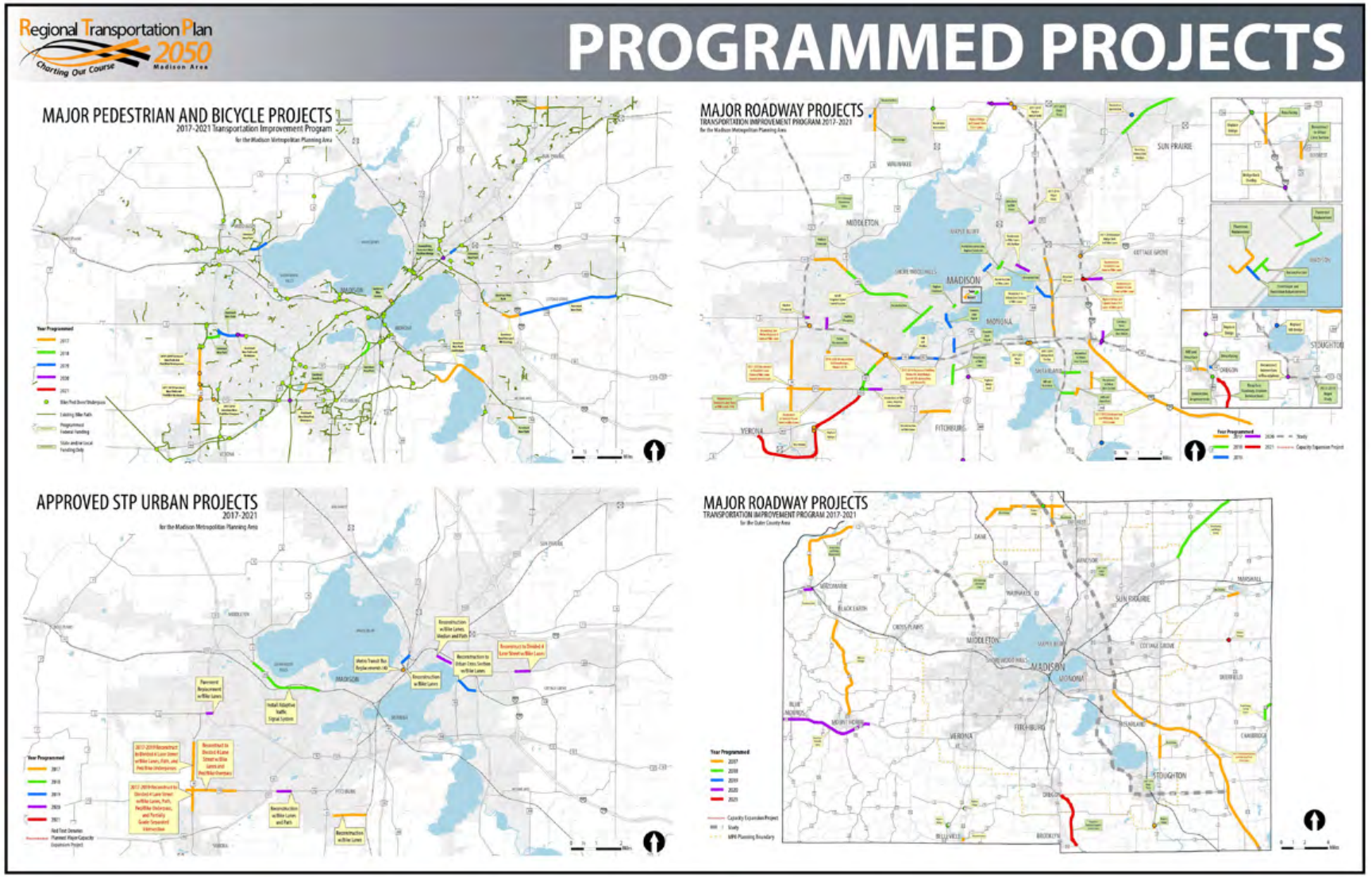




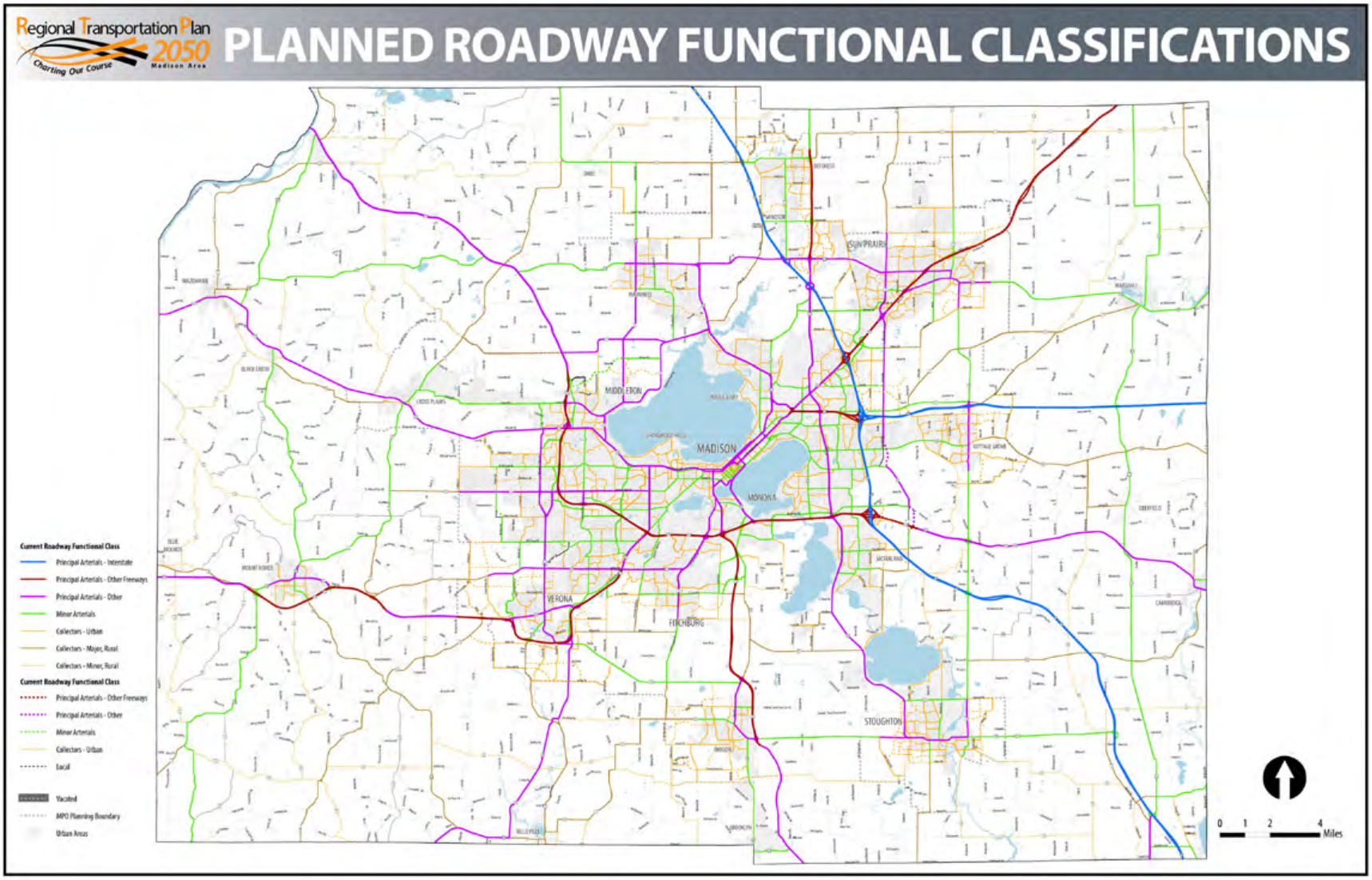

Regional Transportation Plan 2050
Madison Area
Charting Our Course
EXISTING ROADWAY CONDITIONS
2015 TRAVEL TIME INDEX
for National Highway System Routes, 4PM - 7PM
within the Madison Metropolitan Area
2015 PLANNING TIME INDEX
for National Highway System Routes, 4PM - 7PM
within the Madison Metropolitan Area
2010 - 2014 VEHICULAR CRASH SUMMARY
Fatal and Serious Injuries on State Highways
and at Intersections
within the Madison Metropolitan Area
1992-2013 AVERAGE WEEKDAY TRAFFIC VOLUME CHANGE
within the Madison Metropolitan Area
2013 AVERAGE WEEKDAY TRAFFIC VOLUME
within the Madison Metropolitan Area
BRIDGE AND PAVEMENT CONDITION
for Roadways within the Madison Metropolitan Area

COMMUTING
Regional Transportation Plan 2050
Charting Our Course
Madison Area
DAILY WORK TRIP COMMUTING
Dodge
Jefferson
Columbia
Dane
Rock
Sauk
Green
Iowa
Lafayette
1404
5311
1713
8698
10147
1669
5177
659
1636
4980
751
3221
Travel Time to Work, 2014
Mode of Transportation to Work, 2014
RIDESHARE
FEELIN' BETTER ALREADY!
DAILY WORK TRIP COMMUTING
HOUSING + TRANSPORTATION COSTS
Affordability with a Typical Family
VANPOOLS TO MADISON
Bicycle


Regional Transportation Plan 2050
Madison Area
Charting Our Course
FREIGHT
FREIGHT ROUTES, FACILITIES, AND SERVICES
within the Madison Metropolitan Area
FREIGHT TRAFFIC CONGESTION
Volume to Capacity Ratio, 2007
within the Madison Metropolitan Area
ANNUAL TRUCK FREIGHT TONNAGES, 2007
within the Madison Metropolitan Area
RAIL NETWORK
within the Madison Metropolitan Area
Freight Tonnage to and From Dane County
2007 Shipments
2013 Shipments
Inbound
Outbound
KOHL'S


Regional Transportation Plan 2050
Charting Our Course
Madison Area
PROGRAMMED PROJECTS
MAJOR PEDESTRIAN AND BICYCLE PROJECTS
2017-2021 Transportation Improvement Program
for the Madison Metropolitan Planning Area
MAJOR ROADWAY PROJECTS
TRANSPORTATION IMPROVEMENT PROGRAM 2017-2021
for the Madison Metropolitan Planning Area
APPROVED STP URBAN PROJECTS
2017-2021
for the Madison Metropolitan Planning Area
MAJOR ROADWAY PROJECTS
TRANSPORTATION IMPROVEMENT PROGRAM 2017-2021
for the Outer County Area

REGIONAL TRAVEL FORECASTS
Regional Transportation Plan 2050
Madison Area
Charting Our Course
MODELING SCENARIO ONE
Existing and Programmed Projects and New/Planned Collector Streets within the Madison Metropolitan Area
MODELING SCENARIO TWO
Including Beltline and Stoughton Road Potential Capacity Expansion Projects within the Madison Metropolitan Area
MODELING SCENARIO THREE
Additional Potential Capacity Expansion Projects Including North Mendota Parkway and County Highway Q within the Madison Metropolitan Area
CONGESTION 2050 - SCENARIO ONE
Existing and Programmed Projects and New/Planned Collector Streets within the Madison Metropolitan Area
CONGESTION 2050 - SCENARIO TWO
Including Beltline and Stoughton Road Potential Capacity Expansion Projects within the Madison Metropolitan Area
CONGESTION 2050 - SCENARIO THREE
Additional Potential Capacity Expansion Projects Including North Mendota Parkway and County Highway Q within the Madison Metropolitan Area


Regional Transportation Plan 2050
Charting Our Course
Madison Area
PLANNED ROADWAY FUNCTIONAL CLASSIFICATIONS
MADISON
MIDDLETON
VERONA
FITCHBURG
STOUGHTON
SUN PRAIRIE
MONONA
Current Roadway Functional Class
Principal Arterials - Interstate
Principal Arterials - Other Freeways
Principal Arterials - Other
Minor Arterials
Collectors - Urban
Collectors - Major, Rural
Collectors - Minor, Rural
Current Roadway Functional Class
Principal Arterials - Other Freeways
Principal Arterials - Other
Minor Arterials
Collectors - Urban
Local
Vacated
MPO Planning Boundary
Urban Areas
0 1 2 4
Miles



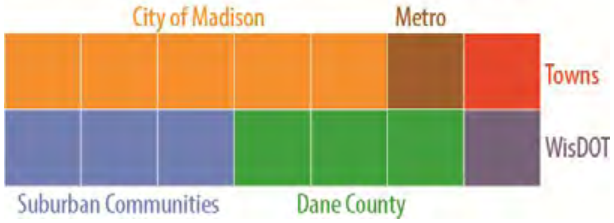
PRESENTATION OVERVIEW

- What is MATPB?
- Draft Regional Transportation Plan 2050
  - Introduction
  - National & Regional Trends and Forecasts
  - Our Transportation System
  - Goals, Policies, and Performance Measures
  - Needs Analysis and Recommendations
  - Financial Capacity Analysis

WHAT IS MATPB?

- Metropolitan Area Transportation Planning Policy Body
  - Responsible for cooperative regional transportation planning and decision-making
  - Approves use of federal transportation funding
  - Designated by Governor as Metropolitan Planning Organization (MPO) for Madison Urban Area
  - Formal intergovernmental agreement signed by local units of government representing over 75% of metro area population (May 2, 2007)

Governance Structure
for Madison Area Transportation Planning Board





CHAPTER 1: INTRODUCTION

- Purpose of the Plan
- The Planning Process
- Relationship to Other Plans and Studies
- Stakeholder Involvement and Public Outreach

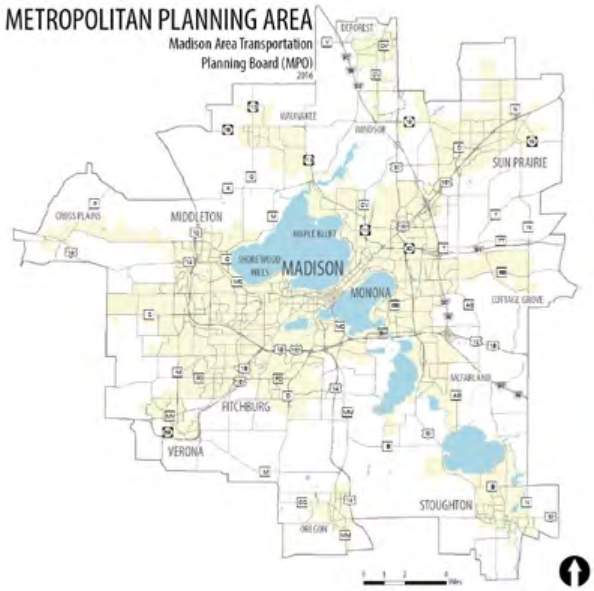
WHAT IS THE RTP AND WHAT IS ITS PURPOSE?

- Integrated, multi-modal, long-range transportation plan
- Provides the overall framework for transportation planning in the region.
- Official plan for federal and state funding purposes
- Based upon and designed to support the regional land use policy plan and local comprehensive plans
- Identifies future transportation projects, studies, and strategies/actions to be implemented over the next 20+ years
- Financially constrained plan
- Updated every 5 years



PRIMARY MATPB PLANNING AREA

- Official jurisdictional area of MPO within which federal planning requirements apply
- Must cover existing urbanized area boundary (defined by US Census Bureau every 10 years)
- Also covers contiguous area expected to become urbanized within 20+ year period, including important regional transportation corridors



RELATIONSHIP TO OTHER PLANS AND STUDIES

Builds upon and incorporates a number of plans, studies, and reports including (but not limited to):



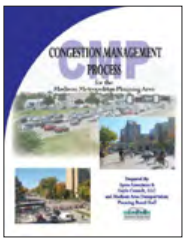












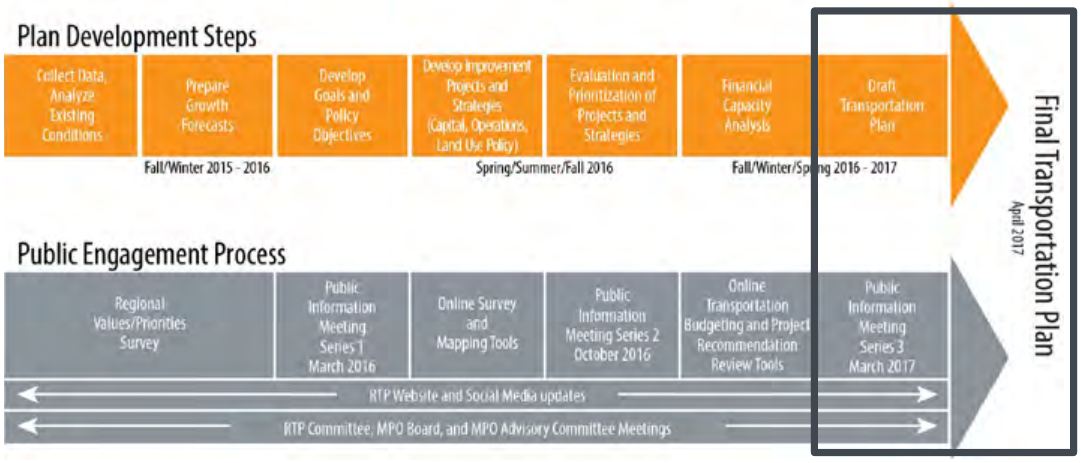






WHERE ARE WE IN THE PROCESS?

Regional Transportation Plan Process and Schedule





CHAPTER 2:

NATIONAL & REGIONAL TRENDS AND FORECASTS

- Introduction
- Demographics
- Economics
- Land Use and Development
- Commuting Patterns
- Emerging Technologies

POPULATION

- Dane County's population continues to grow at a steady rate, accounting for nearly ¼ of state's growth since 2000.
- Percentage growth in many suburban communities is higher than in City of Madison, but city has still accounted for over 1/3 of county growth since 1990.

Population Growth in Selected Communities

	Total Population			Change	
Community	1990	2000	2010	1990-2000	2000-2010
Cottage Grove, Village	1,131	4,059	6,192	258.9%	52.5%
Fitchburg, City	15,648	20,501	25,260	31.0%	23.2%
Madison, City	190,776	208,054	233,209	9.1%	12.1%
Madison, Town	6,442	7,005	6,279	8.7%	-10.4%
Maple Bluff, Village	1,352	1,358	1,313	0.4%	-3.3%
Middleton, City	13,785	15,770	17,442	14.4%	10.6%
Monona, City	8,637	8,018	7,533	-7.2%	-6.0%
McFarland, Village	5,232	6,416	7,808	22.6%	21.7%
Shorewood Hills, Village	1,680	1,732	1,565	3.1%	-9.6%
Stoughton, City	8,786	12,354	12,611	40.6%	2.1%
Sun Prairie, City	15,352	20,369	29,364	32.7%	44.2%
Verona, City	5,374	7,052	10,619	31.2%	50.6%
Waunakee, Village	5,897	8,995	12,097	52.5%	34.5%
Westport, Town	2,732	3,586	3,950	31.3%	10.2%

Population Growth in Dane County and Madison

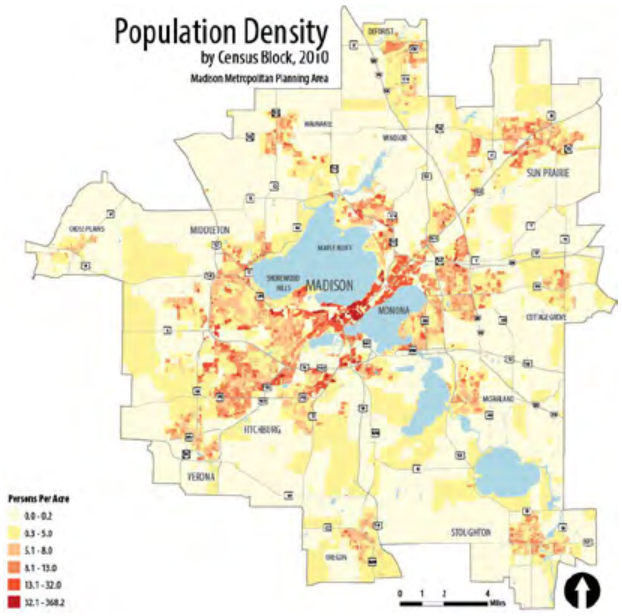
	Total Population			Change	
	1990	2000	2010	1990-2000	2000-2010
Dane County	367,085	426,526	488,073	16.2%	14.4%
City of Madison	190,766	208,054	233,209	9.1%	12.1%
City as % of County	52.0%	48.8%	47.8%		

POPULATION

Madison Metropolitan Area Population

2010 Census and 2050 Forecast

Municipality	2010 Census Population	% of County	2050 Forecast Population	% of County	Change Number	Change Percent
Central Urbanized Area Total	302,224	62%	379,118	60%	76,894	25%
City of Madison	234,618	48%	292,522	46%	57,904	25%
City of Fitchburg	25,413	5%	34,370	5%	8,957	35%
City of Middleton	17,548	4%	24,571	4%	7,023	40%
Village of McFarland	7,855	2%	10,379	2%	2,524	32%
Larger Outer Urbanized Area Total	93,111	19%	148,375	23%	55,264	59%
City of Sun Prairie	29,364	6%	50,883	8%	21,519	73%
City of Stoughton	12,611	3%	14,366	2%	1,755	14%
City of Verona	10,619	2%	18,840	3%	8,221	77%
Village of Cottage Grove	6,192	1%	10,594	2%	4,402	71%
Village of Waunakee	12,097	2%	19,279	3%	7,182	59%
Northern (DeForest/Windsor)	12,997	3%	20,794	3%	7,797	60%
Village of Oregon	9,231	2%	13,619	2%	4,388	48%
Smaller USAs Total	26,740	5%	36,151	5%	9,411	35%
Rural Total	65,998	14%	73,785	12%	7,787	12%
County Total	488,073		637,429		149,356	31%



HOUSEHOLDS

Madison Metropolitan Area Households

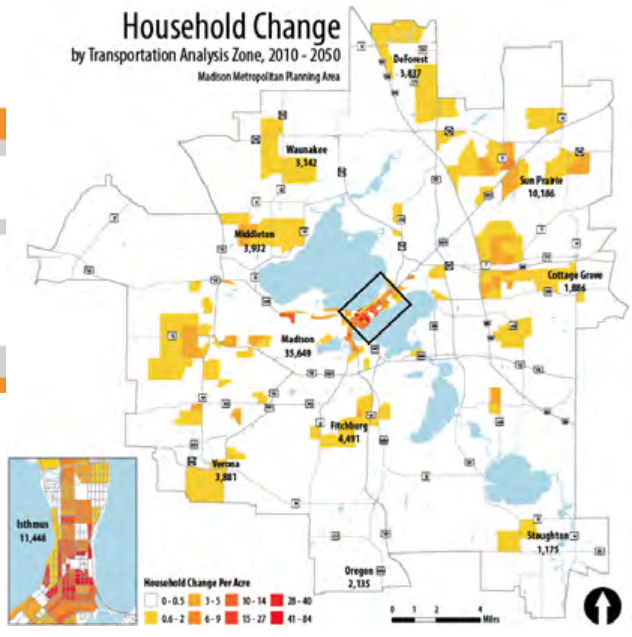
2010 Census and 2050 Forecast

Municipality	2010 Census Households	% of County	2050 Forecast Households	% of County	Change Number	Change Percent
Central Urbanized Area Total	132,172	65%	177,828	62%	45,656	35%
City of Madison	103,132	51%	138,781	49%	35,649	35%
City of Fitchburg	10,015	5%	14,506	5%	4,491	45%
City of Middleton	8,085	4%	12,017	4%	3,932	49%
Village of McFarland	3,097	2%	4,268	2%	1,171	38%
Larger Outer Urbanized Area Total	36,164	18%	62,406	22%	26,242	73%
City of Sun Prairie	11,636	6%	21,822	8%	10,186	88%
City of Stoughton	5,133	3%	6,308	2%	1,175	23%
City of Verona	4,223	2%	8,104	3%	3,881	92%
Village of Cottage Grove	2,210	1%	4,096	1%	1,886	85%
Village of Waunakee	4,344	2%	7,486	3%	3,142	72%
Northern (DeForest/Windsor)	5,029	2%	8,866	3%	3,837	76%
Village of Oregon	3,589	2%	5,724	2%	2,135	59%
Smaller USAs Total	10,497	5%	15,850	6%	5,353	51%
Rural Total	24,917	12%	29,100	10%	4,183	17%
County Total	203,750		285,184		81,434	40%

Average Household Size in Dane County Communities

Historical Census Data and Forecasts

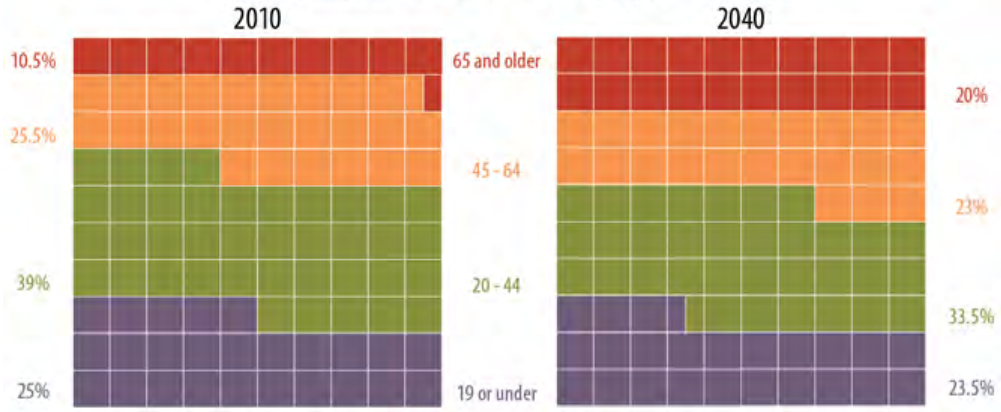
	1970	1980	1990	2000	2010	Projections 2020	2030	2040
Towns	3.73	3.01	2.8	2.59	2.57	2.5	2.46	2.43
Villages	3.17	2.85	2.74	2.72	2.61	2.53	2.49	2.46
Small Cities	3.26	2.54	2.29	2.35	2.37	2.31	2.17	2.24
Madison	2.88	2.38	2.3	2.19	2.17	2.11	2.07	2.03
Dane County	3.09	2.56	2.46	2.37	2.33	2.27	2.23	2.2



AGE

Dane County's population is projected to age over the coming years, following state and regional trends.

Existing and Forecasted Dane County Age Distribution



RACE AND ETHNICITY

Dane County has been becoming much more diverse in recent years.

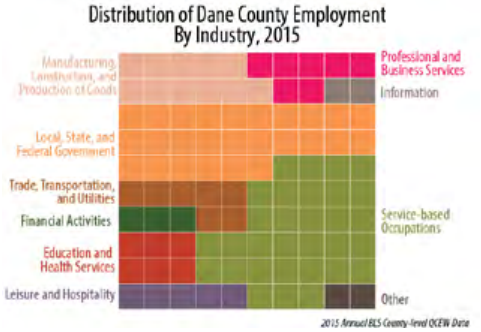
Race

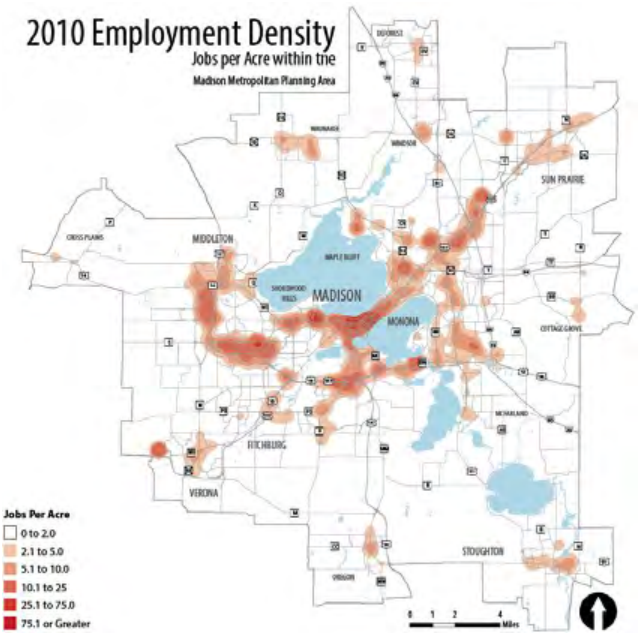
Race	Number 2010	Percent of Total 2010	Increase 2000 -2010
White	413,631	85%	9%
Black/African American	25,347	5%	49%
Asian	23,035	5%	56%
Other Minority	13,960	3%	82%
Two or More Races	12,100	3%	59%
Total Population	**488,073**	**100%**	**14%**

Ethnicity

Ethnicity	Number 2010	Percent Total 2010	Increase 2000-2010
Hispanic	28,925	6%	101%
Non Hispanic	459,148	94%	11%
Total Population	**488,073**	**100%**	**14%**

EMPLOYMENT



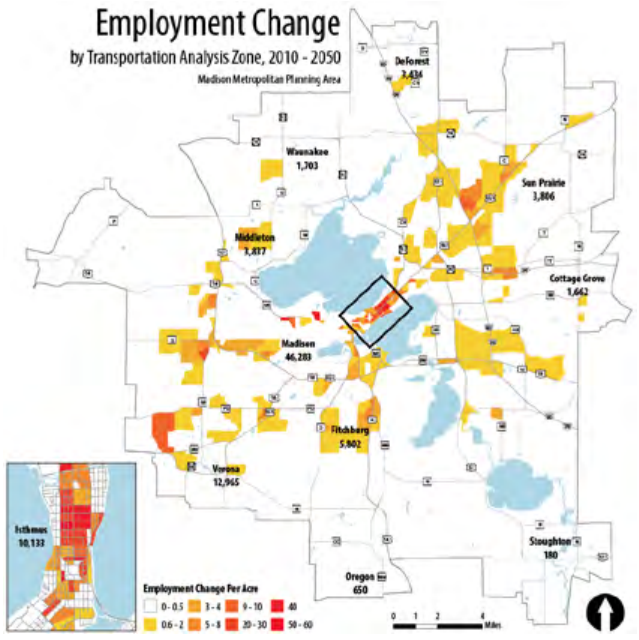


EMPLOYMENT

Madison Metropolitan Area Employment

2010 InfoUSA and 2050 Forecast

Municipality	2010 InfoUSA Employment	% of County	2050 Forecast Employment	% of County	Change Number	Change Percent
Central Urbanized Area Total	249,579	80%	307,366	77%	57,787	23%
City of Madison	195,888	62%	241,093	60%	45,205	23%
City of Fitchburg	12,165	4%	17,967	5%	5,802	48%
City of Middleton	19,104	6%	22,941	6%	3,837	20%
Village of McFarland	1,943	1%	2,511	1%	568	29%
Larger Outer Urbanized Area Total	45,094	14%	70,545	18%	25,451	56%
City of Sun Prairie	11,362	4%	15,168	4%	3,806	34%
City of Stoughton	6,445	2%	6,625	2%	180	3%
City of Verona	9,315	3%	22,280	6%	12,965	139%
Village of Cottage Grove	2,625	1%	4,287	1%	1,662	63%
Village of Waunakee	5,901	1%	8,406	2%	2,505	42%
Northern (DeForest/Windsor)	6,054	2%	9,737	2%	3,683	61%
Village of Oregon	3,392	1%	4,042	1%	650	19.16%
Smaller USAs Total	9,567	3%	11,267	3%	1,700	18%
Rural Total	9,478	3%	9,480	2%	2	0%
County Total	313,718		398,658		84,940	27%

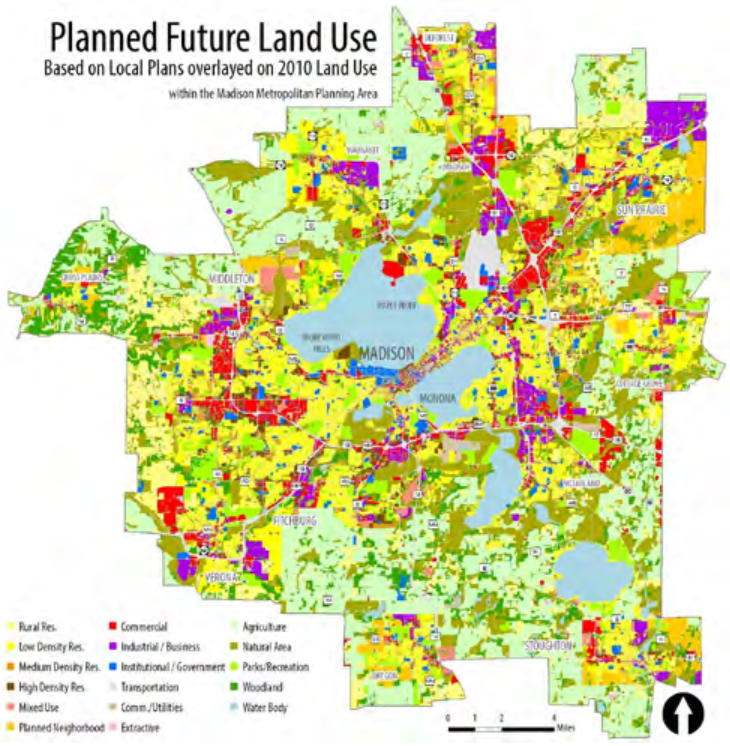


LAND USE

Composite land use plans map

Served as basis for allocation of forecast growth, which in turn is main input for the future travel forecasts.

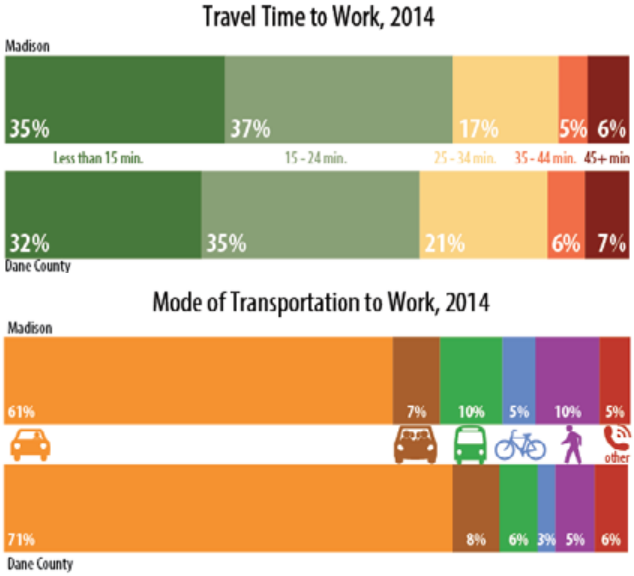
Assumed growth only fraction of complete build out represented on map.



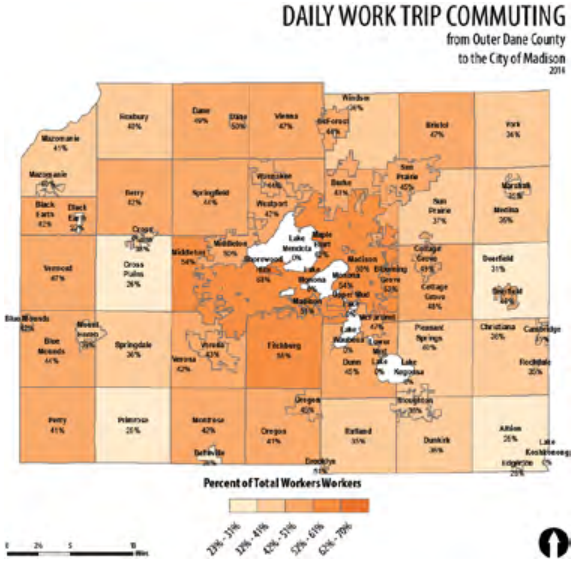
COMMUTING PATTERNS

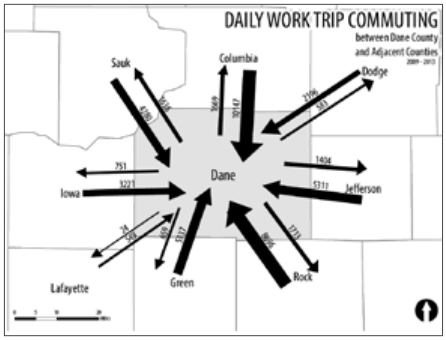
Strong majority of county residents have relatively short commutes.

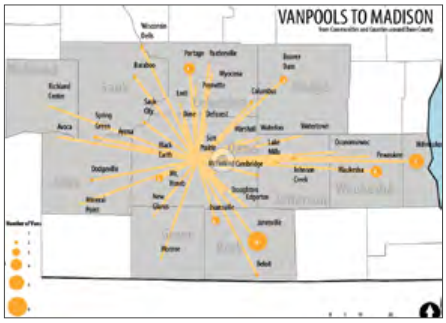
Though most area residents drive to work, more people take transit, bicycle, walk, and telecommute than in other similarly sized and even larger urban areas.



COMMUTING PATTERNS





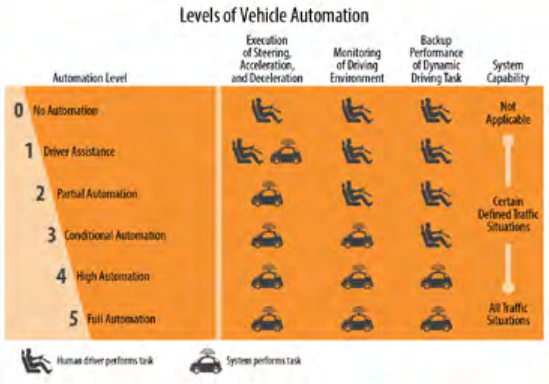


Dane County and Madison are net-importers of workers.

EMERGING TECHNOLOGY

A number of technologies are on the horizon that may change commuting and development patterns, including:

- Autonomous vehicles
- On-demand ride sharing services
- 3D-printing
- The "Internet of Things"
- Drones
- Wireless power transfer









CHAPTER 3: OUR TRANSPORTATION SYSTEM

- Motor Vehicles
- Bicycles
- Pedestrians
- Public Transit
- Travel Demand Management/Ridesharing
- Inter-Regional Travel
- Freight/Goods Movement

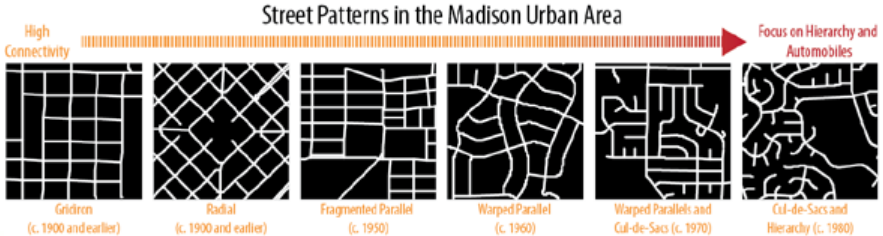
INTRODUCTION

The design of the metropolitan area's roadway network influenced by when roadways were developed and geographic constraints.

Improving connectivity is a key issue in the region.



Street Patterns in the Madison Urban Area



MOTOR VEHICLES: FUNCTIONAL CLASSIFICATION

Functional Classification defines the role that roadway plays (mobility, connectivity, accessibility) in serving travel needs.

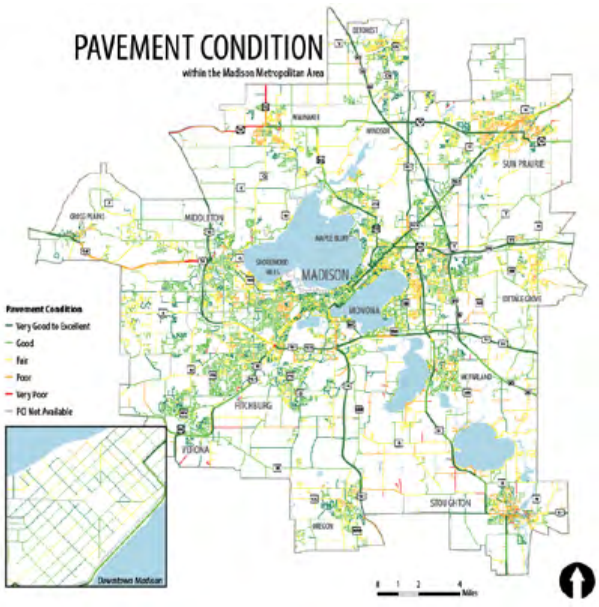
It carries expectations about design, speed, capacity, and relationship to existing and future land use.



MOTOR VEHICLES: PAVEMENT CONDITION

State highways are, in general, in better condition than local roadways.

- 100% of Interstate and 78% of US highways in good or better condition
- 64% of state highways rated good or better, while 16% in poor or worse condition
- 61% of local arterial/collector roadways rated good or better, while only 7% in poor or worse condition
- Condition of local roadways getting slowly worse



PASER Ratings and Corresponding Treatments

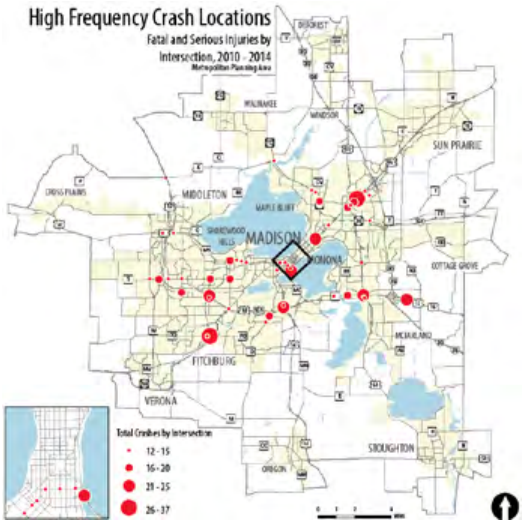
Quality	Rating	Treatment for Pavement	Treatment for Concrete
Excellent	9-10	No maintenance required	No maintenance required
Good	7-8	Crack sealing and minor patching	Routine maintenance
Fair	5-6	Preservation treatments (non-structural)	Surface repairs, partial-depth patching
Poor	3-4	Structural renewal (overlay)	Extensive slab or joint rehabilitation
Very Poor	1-2	Reconstruction	Reconstruction

MOTOR VEHICLES: BRIDGE CONDITION

- "Bridge sufficiency" rating incorporates structural evaluation, design obsolescence, and essentialness.
- Bridge must score below 80 for repair funding and 50 for replacement funding.
- 95% of regional bridges are rated fair (50-79.9 sufficiency rating) or better.



MOTOR VEHICLES: SAFETY





Many higher-volume arterials experience high crash frequency. Funding is available to reduce traffic fatalities and injuries at these areas for projects that reduce the number and severity of crashes.

MOTOR VEHICLES: CONGESTION

- VMT increased on average 0.6% per year from 2000 to 2015.
- Beltline, I-39/90/94 , Verona Rd., Stoughton Road, University Ave, Fish Hatchery, USH 151 have highest volumes and have seen the biggest increases in traffic volume.

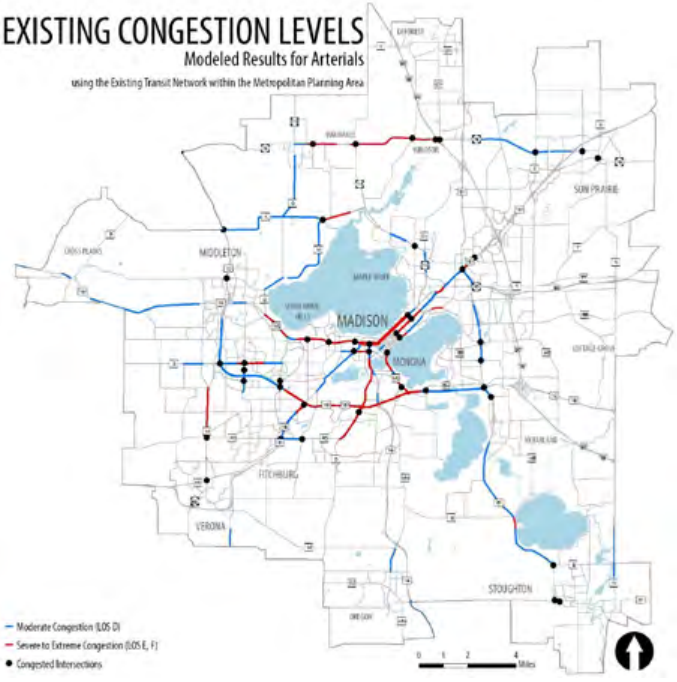
Estimated Daily VMT for Dane County

Year	VMT	Change from Previous Year
2000	12,497,100	-
2001	12,636,700	1.1%
2002	13,202,000	4.5%
2003	13,256,000	0.4%
2004	13,450,000	1.5%
2005	13,346,300	-0.8%
2006	13,621,900	2.1%
2007	13,561,000	-0.4%
2008	12,993,400	-4.2%
2009	13,214,200	1.7%
2010	13,258,300	0.3%
2011	13,116,500	-1.1%
2012	13,724,431	4.6%
2013	13,291,000	-3.2%
2014	13,481,513	1.4%
2015	13,637,621	1.2%



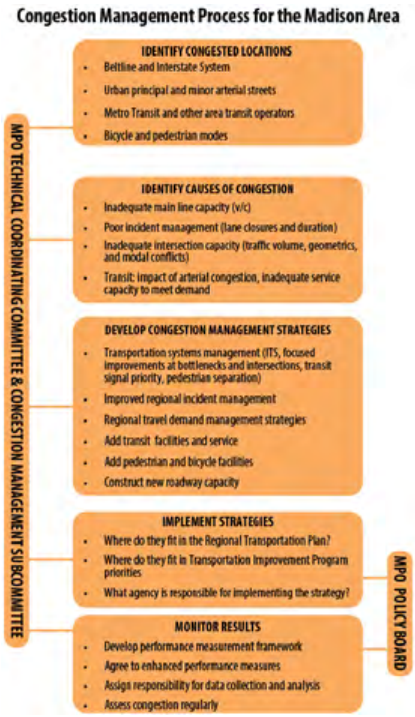


MOTOR VEHICLES: CONGESTION



MOTOR VEHICLES: CONGESTION

- Top causes of congestion:
  - Physical bottlenecks (40%)
  - Traffic Incidents (25%)
  - Work Zones (10%)
  - Weather (15%)
  - Traffic Control Devices (5%)
  - Special Events (5%)
  - Normal fluctuations
- One source of congestion can trigger another to occur
- Congestion Mitigation Process (CMP) helps to identify causes of congestion, identify projects, identify implementing agency, and monitor results.
- CMP last updated in 2011



BICYCLES

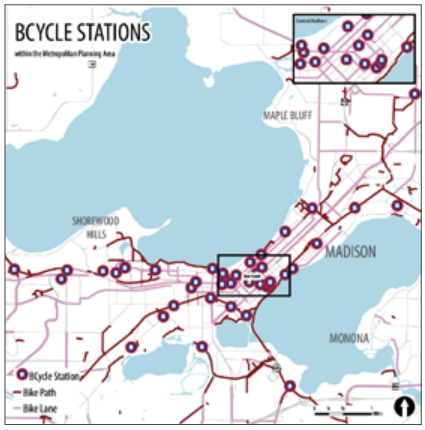
The region is well served by a nationally-renowned bikeway network. Bikeway construction began in earnest in the 1990s and most major roadway projects now feature provisions for bicyclists and pedestrians.

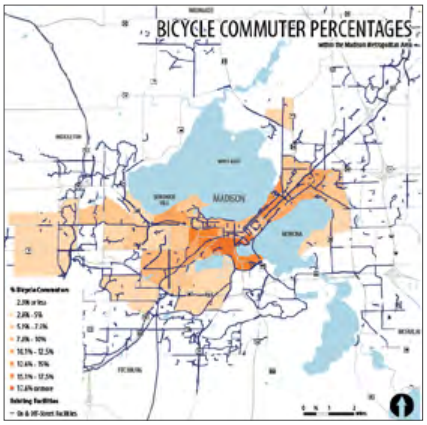




BICYCLES

High-quality facilities helped Madison become an early pioneer in bicycle sharing. Further, the facilities have led to increase in percentage of bicycle commuters. New wayfinding plan should increase existing facility visibility and increase already high utilization.





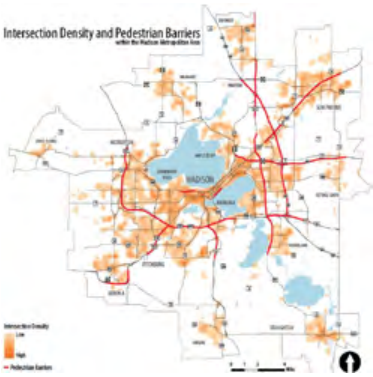


PEDESTRIANS

55% of urban arterial and collector streets in the metro area have sidewalks on both sides where they are expected, 21% have sidewalk on one side, and 24% have no sidewalks at all.

They are most needed in areas with high population density and pedestrian-generating uses.

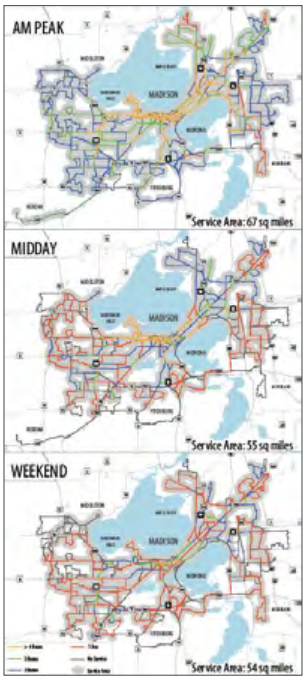




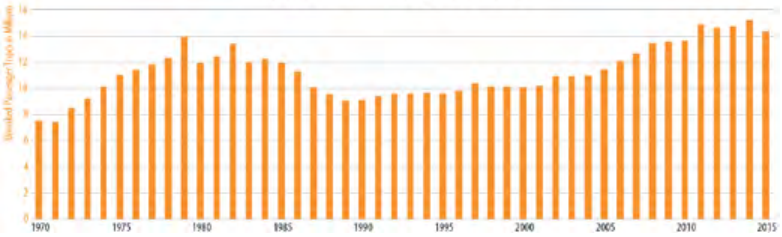


PUBLIC TRANSPORTATION

- Madison area is well-served by local bus service during the AM and PM peak periods. Service frequency diminishes greatly during off-peak periods and weekends. Regional commuter express service is not available.
- Bus service limited to central urban area and Verona.
- Ridership had been rising nearly every year until 2015, but declined the past two years.
- Funding for transit continues to be a problem due to lack of a local funding mechanism other than property taxes combined with stagnant state and federal funding.

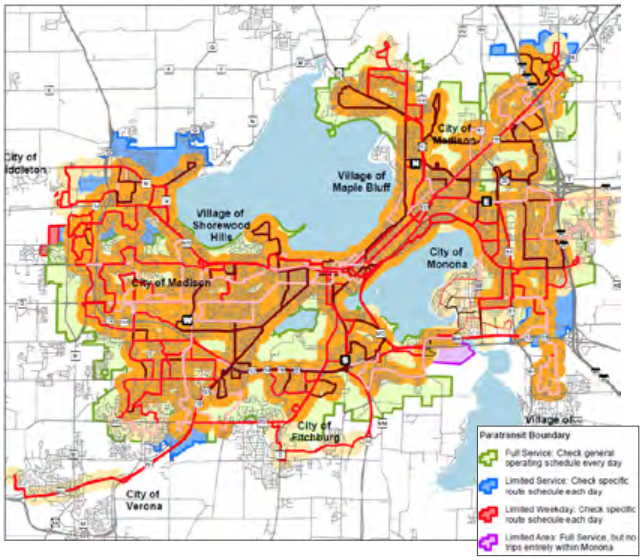


Metro Transit Ridership 1970-2015



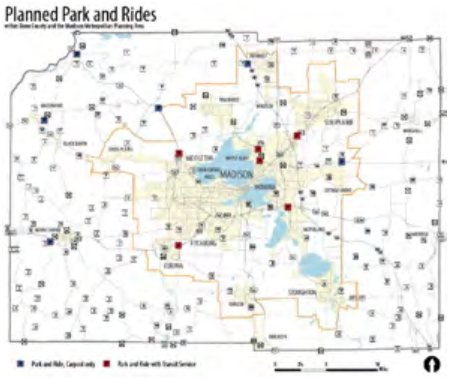
SPECIALIZED TRANSIT

- Metro provides paratransit service in accordance with the Americans with Disabilities Act (ADA)
  - Shadows all-day fixed-route bus system, excluding peak-period commute-oriented service
- Dane County operates other services, such as group access service and rural senior group transportation program
- Sun Prairie and Stoughton offer accessible shared-ride, door-to-door service.
- Union Cab offers private, non-subsidized, door-to-door accessible service in Madison



TRAVEL DEMAND MANAGEMENT

- MATPB administers the Rideshare, Etc. Program. Program signups have decreased in recent years, but overall participation remains near 2,000.
- The State Vanpool program operates 70 vanpools with nearly 1,000 passengers
- 12 park and ride lots are available in Dane County, 5 of which have Metro service.
- MATPB collaborates with Metro, UW-Madison, and Dane County to run an advertising campaign aimed at raising awareness of commuter options.
- Multiple community efforts promote cycling such as *Bike Week* and *Love to Ride Madison*



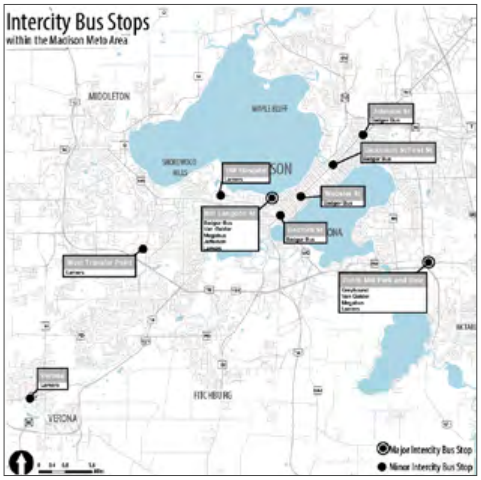
RIDESHARE
FEELIN' BETTER ALREADY!





INTERCITY TRAVEL

- Intercity service is available via bus to major regional cities and many cities in between.
- The community lacks an inter-city bus terminal; however, many buses stop on Langdon street on the UW campus and at Dutch Mill Park and Ride.
- Site have been investigated for a terminal, which could be constructed as part of replacement of the Lake Street parking garage.





FREIGHT AND GOODS MOVEMENT

- Freight shipments have increased in recent years while shifting towards trucks.
- Freight arriving by air has increased in recent years, which is significant because much of air-tonnage is high-value goods
- Value of inbound and outbound shipments surpassed $24 billion in 2014
- Top imports include stone/riprap, gravel/sand, and warehouse goods. Top exports include gravel/sand, grain, and stone/riprap

Dane County Freight Tonnages by Mode (2014)

Mode											
Truck	5,362,444	3,542,396	8,904,841	60.2%	40%	5,888,514	5,606,314	11,494,828	51.2%	48.8%	2,689,808	99.9%
Rail	16,072	77,736	93,808	17.1%	83%	91,320	310,452	402,772	22.7%	77.1%	3,600	0.1%
Air	3,961	8,993	12,953	30.6%	69%	3,924	9,090	13,013	30.2%	69.8%	0	0.0%
Unknown	0	78	77	0.0%	100%	0	81	81	0.0%	100.0%	0	0.0%
Total	5,382,476	3,629,204	9,011,680	59.7%	40%	5,983,758	5,926,739	11,910,697	50.2%	49.8%	2,693,408	100.%

Dane County Freight Flows (2014)

Outbound	93,808	8,960,409	12,953	75	9,067,248	$57,318,279	$8,598,329,851	$844,273,852	$3,284,361	$9,502,956,143	
Inbound	402,772	$1,494,628	13,013	83	$1,910,497	$240,770,009	$11,829,391,305	$804,907,825	$1,314,921	$12,875,383,860	
Internal	3,600	2,689,808	0	0	2,693,408	$2,667,151	$1,713,152,252	$0	$0	$1,714,219,403	
Totals	500,180	23,134,845	25,966	161	23,661,153	$300,155,438	$22,138,673,208	$1,649,181,677	$4,599,282	$24,092,598,606	

FREIGHT FACILITIES AND SERVICES

within the Madison Metropolitan Planning Area







CHAPTER 4: GOALS, POLICIES, AND PERFORMANCE MEASURES

- Introduction
- Goals and Policies
- Performance Measures

GOALS AND PERFORMANCE MEASURES

1. **Create Connected Livable Neighborhoods and Communities**
   - Miles of Pedestrian Facilities
   - Miles of Bicycle Facilities
   - B-Cycle Utilization
   - Active Living Index Scores
2. **Improve Public Health, Safety, and Security**
   - Number and Rate of Motor Vehicle Crash Fatalities and Serious Injuries
   - Number and Non-Motorized Fatalities and Serious Injuries
   - County-wide Five-year Rolling Averages
3. **Support Personal Prosperity and Enhance the Regional Economy**
   - Airline Passenger Traffic
   - Freight Exports and Imports
   - Housing + Transportation Costs
   - Transit Access to Jobs
4. **Improve Equity for Users of the Transportation System Transit Ridership**
   - Fixed-Route Transit Service Area
   - Transit Access to Employment
   - Transit Coverage for Underrepresented Groups
5. **Reduce the Environmental Impact of the Transportation System**
   - Vehicle Miles Traveled
   - Mode of Transportation to Work
   - Air Quality
6. **Ensure System-Wide Efficiency, Reliability, and Integration Across Modes**
   - Transit On-Time Performance
   - Percent of Key Destinations Served by Transit
   - Roadway Congestion and Reliability
7. **Ensure Financial Viability of the Transportation System**
   - Bridge Condition
   - Roadway Pavement Condition
   - Metro Vehicle On-Road Service Calls
   - Buses At or Past Replacement Age



CHAPTER 5: NEEDS ANALYSIS AND RECOMMENDATIONS

- Introduction
- Land Use and Transportation Integration
- Streets and Roadways
- Public Transit
- Bicycles
- Pedestrians
- Specialized Transit
- Transportation Demand Management
- TSM, Operations, and ITS
- Freight Air, and Rail
- Parking

INTRODUCTION

- Chapter includes needs analysis and planning/strategic and facility/service recommendations.
- Recommendations include supporting actions
- Recommendations cover the following:
  - Land Use and Transportation Integration
  - Streets and Roadways
  - Public Transit
  - Bicycles
  - Pedestrians
  - Inter-regional Travel
  - Specialized Transit
  - Travel Demand Management (TDM)
  - Transportation System Management (TSM), Operations, and Intelligent Transportation Systems (ITS)
  - Freight, Air, and Rail
  - Parking



LAND USE AND TRANSPORTATION INTEGRATION

1. Adopt local land use plans and policies that support RTP goals and policies
2. Develop urban areas with a mix of housing types and land uses to provide walkable, affordable neighborhoods



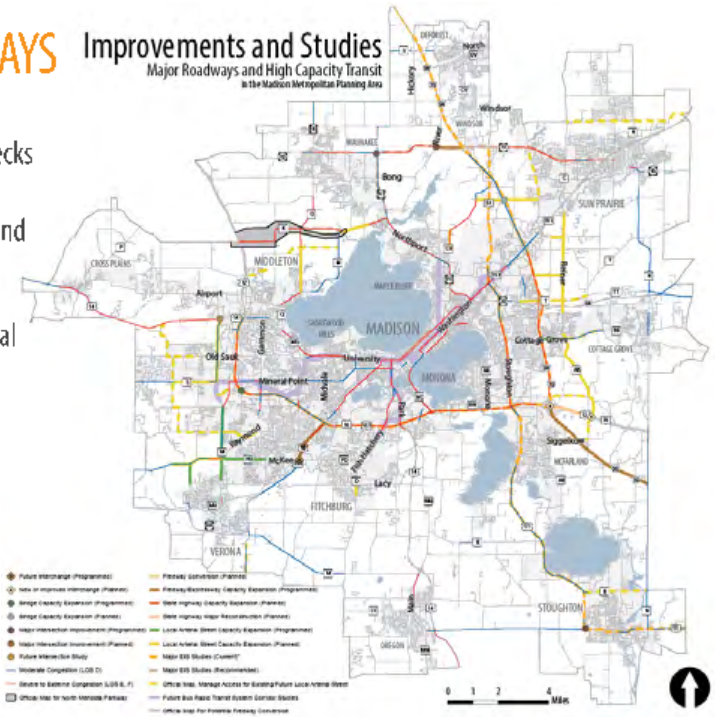
STREETS AND ROADWAYS

1. Preserve and maintain the region's street and highway system.
2. Build a well-connected network of regional roadways to accommodate future growth and efficiently distribute traffic.
3. Incorporate complete streets and green streets concepts for regional and local roadways.



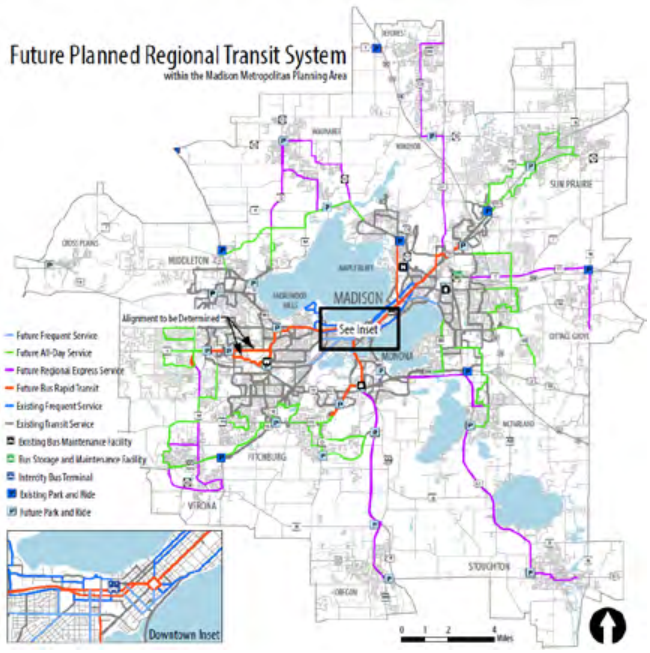
STREETS AND ROADWAYS

4. Expand regional roadway system capacity to address critical bottlenecks and accommodate future planned growth consistent with RTP goals and policies.
5. Address safety needs on the regional roadway system through a comprehensive "3-E" approach.



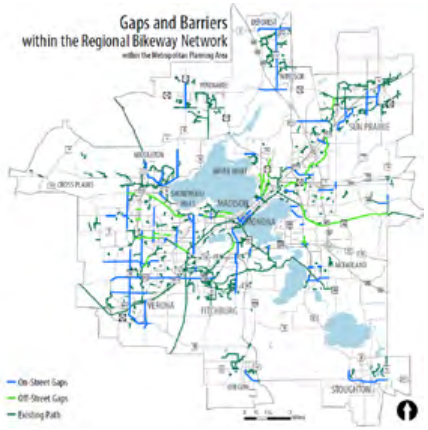
PUBLIC TRANSIT

1. Implement a BRT system.
2. Improve the local bus network.
3. Add all-day service in developing neighborhoods.
4. Enhance transit stops.
5. Utilize alternative service delivery models to serve low-demand areas.
6. Implement a regional express bus network.
7. Expand park-and-ride facilities in conjunction with BRT and express services.
8. Implement a regional transit entity with stable funding and representative governance.



BICYCLES

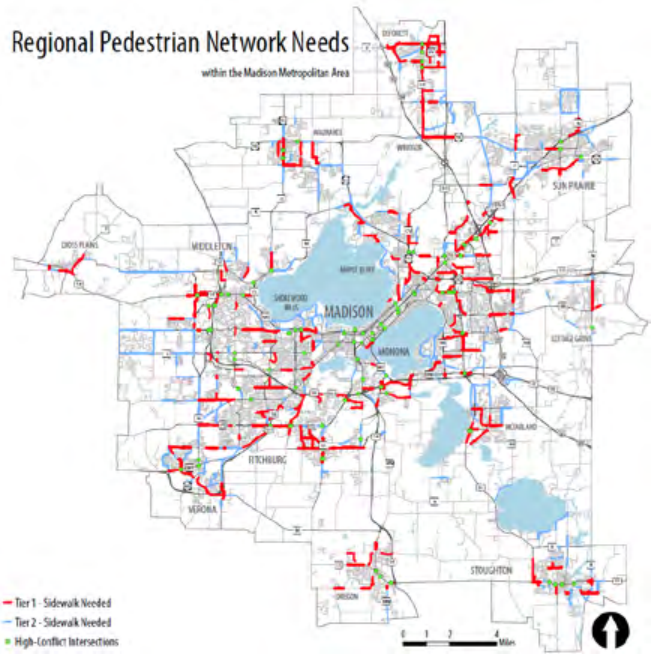
1. Expand the bikeway network with new shared-use paths and on-street facilities.
2. Maintain and modernize existing bicycle facilities.
3. Eliminate bicycle barriers and hazards in the bikeway network.
4. Provide adequate bicycle parking.
5. Improve bicyclist safety through a "3-E" approach.
6. Continue bike share, education, and bicycle supportive policies.





PEDESTRIANS

1. Provide sidewalks and appropriate pedestrian amenities in developing neighborhoods.
2. Retrofit regional streets with modern, safe pedestrian accommodations.
3. Improve safety and usability for pedestrians at intersections and crossings.
4. Maintain sidewalks and pedestrian facilities for year-round use.
5. Design new streets and retrofit existing streets to reduce speeding.



INTER-REGIONAL TRAVEL

1. Initiate planning for and build an inter-city bus terminal
2. Support new and improved inter-city bus service
3. Maintain and preserve the rail network for future passenger rail service



SPECIALIZED TRANSIT

1. Expand the coverage of accessible fixed-route bus and paratransit service.
2. Work collaboratively with private taxi operators to ensure accessible taxi service is available and costs for the service are shared equitably.
3. Continue and expand specialized work-based transportation for low-income people.
4. Utilize emerging technologies to lower operating costs and expand travel options
5. Improve interagency coordination of the various specialized transit services and private services.



TRANSPORTATION DEMAND MANAGEMENT

1. Expand the regional network of park-and-ride lots to encourage carpooling, transit use, and bicycling.
2. Expand the state vanpool program and support the development of additional vanpool programs.
3. Continue to encourage and provide support to large employers, institutions, and municipalities to develop and promote strategies to reduce single occupant motor vehicle trips.
4. Provide financial incentives for people to use alternative transportation and increase funding for marketing programs.
5. Support transportation options at schools through Safe Routes to School programs.





SafeRoutes

TSM, OPERATIONS, AND ITS

1. Implement and periodically update the adopted Congestion Management Process (CMP).
2. Implement access management plans and standards for existing and planned future arterial roadways as development and street reconstruction occur.
3. Modernize the multimodal transportation network using technology.
4. Implement and periodically update the Regional Intelligent Transportation System Strategic Plan.



FREIGHT, RAIL, AND AIR

1. Maintain and promote new industrial uses along freight corridors.
2. Maintain and expand existing infrastructure on the multimodal freight network, prioritizing projects that improve safety, increase efficiency, and minimize lifetime costs.
3. Increase focus on freight planning for regional and local transportation facilities.
4. Maintain the availability of rail facilities for current and future uses.
5. Mitigate conflicts between rail and other uses.
6. Ensure the compatibility of uses near airports.
7. Improve airport facilities to enhance usability and convenience for passenger traffic.
8. Improve the airport's freight accommodations and connections.

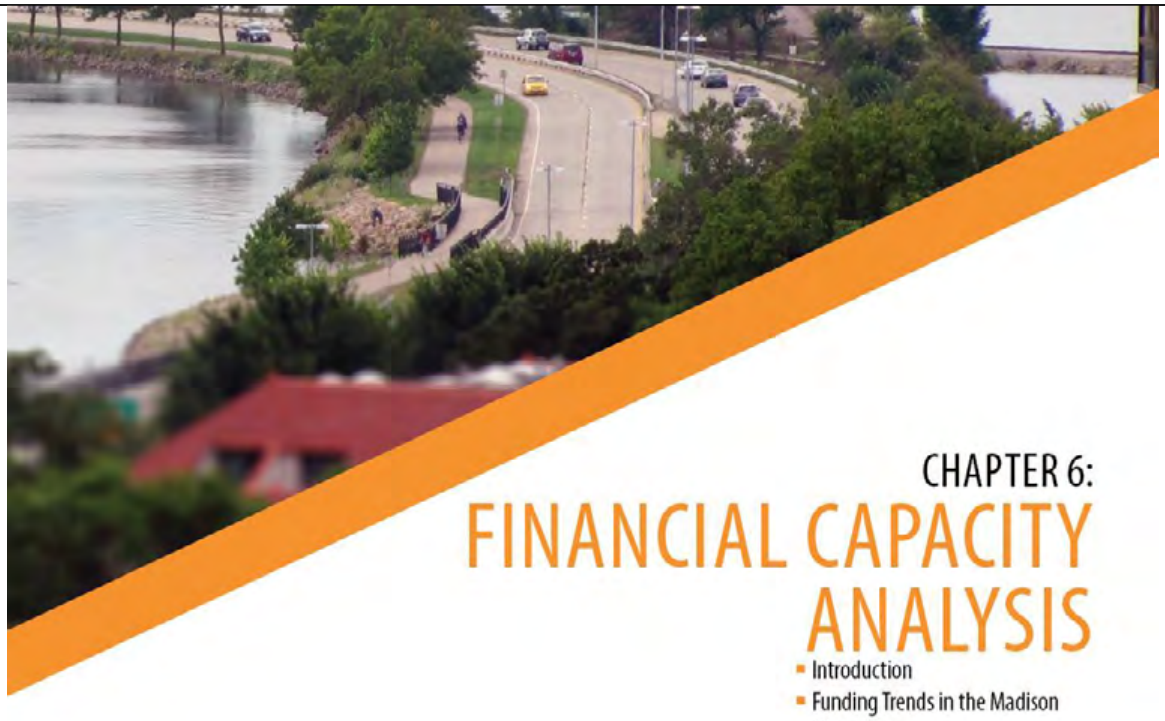




PARKING

1. Use parking management strategies to reduce congestion within downtown areas and major activity centers.
2. Modify parking requirements to encourage multi-modalism and innovative design using a more market-based approach.
3. Ensure flexibility of parking facilities to accommodate future technologies.





CHAPTER 6: FINANCIAL CAPACITY ANALYSIS

- Introduction
- Funding Trends in the Madison Metro Area
- Projected Revenues Through 2050
- Projected Expenses Through 2050
- Conclusion

INTRODUCTION

- RTPs must be "fiscally constrained" to demonstrate that recommended projects can realistically be addressed with projected revenues.
- If a shortfall exists, new sources of revenue must be identified.
- Requires project prioritization, balancing the needs of new facilities or capacity expansion projects with system preservation needs.



FUNDING TRENDS : ROADWAYS

- Revenue based on recent funding levels
- Much more funding for (re)construction than maintenance on state side, more balanced locally

Annual Roadway Revenue Estimates ($000's)
for the Madison Metropolitan Planning Area

Roadway Construction	Funding Program	Avg. Annual Funding ($000s)
State Highways		
Federal/State Funding	Combined Backbone and non-Backbone and Majors	$ 69,876
Local Roadways		
Federal/State Funding	STBG, Local Roads Improvement Program (LRIP), Federal Safety Programs, Local Bridges, 70% General Transportation Aids , 70% Connecting Highway Aids	$ 24,035
Local Funding	Total County/Local Revenue (from State Department of Revenue) less Federal/State Funding Estimate	$ 45,001
Subtotal of Local Roadways		***$69,035***
Subtotal		**$ 138,912**
Roadway Maintenance and Operations	**Funding Program**	**Avg. Annual Funding ($000s)**
State Highways		
Federal/State Funding	State Highway Maintenance and Operations, State Highway Rehabilitation (SHR) Bridges, SHR Large Bridges	$ 7,964
Local Roadways		
Federal/State Funding	30% General Transportation Aids, 30% Connecting Highway Aids	$ 6,012
Local Funding	Total County/Local Revenues (from State Department of Revenue) less Federal/State Funding Estimate	$ 52,390
Subtotal of Local Roadways		***$58,402***
Subtotal		**$ 66,365**
Total		**$205,277**

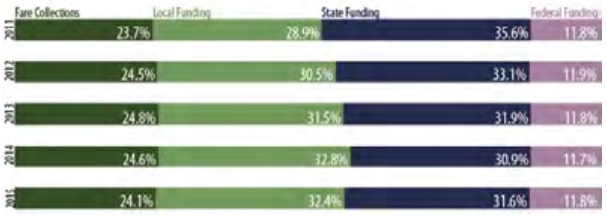
FUNDING TRENDS : TRANSIT

- Funded through a mixture of federal funding, state operating assistance, fares, and local funds (property taxes).
- Federal funding and state operating assistance have remained flat.
  - State assistance now covers 31.6% of budget, compared to 45% in the mid-1990s
- Local funding has been a growing component of funding.
- Metro finding it more and more difficult to maintain bus fleet replacement schedule, let alone address other capital needs.

Annual Transit Revenue Estimates ($000's)
for the Madison Metropolitan Planning Area

Metro Transit	Funding Program	Avg. Funding ($000s)
Capital		
Federal Funding	Urbanized Area Formula Program (5307), State of Good Repair Formula Program (5337), Bus & Bus Facilities Formula Program (5339)	$ 4,830
Local Funding	City of Madison Property Taxes and Cooperative Agreements with Neighboring Municipalities	$ 1,208
Subtotal		**$6038**
Operating		
Federal Funding	Urbanized Area Formula Program (5307), Special Needs/ADA (5310)	$ 6,189
State Funding	State Operating Assistance	$ 17,063
Local Funding	City of Madison Property Taxes and Cooperative Agreements with Neighboring Municipalities, Advertising and Other Revenues	$ 15,674
Passenger and other General Revenue	Collections on Buses, Transit Passes, Advertising, etc.	$ 13,467
Subtotal		**$ 52,393**
Total		**$58,431**

Metro Operating Revenue Summary
2011 - 2015



FUNDING TRENDS : BICYCLE AND PEDESTRIAN

- Primary source for bicycle and pedestrian facilities is local funding.
- Dane County recently created the PARC & Ride Bicycle Grant Program, which has provided $750,000 in the last two years to local communities.
- MATPB allocates Transportation Alternatives Program (TAP) funding to local communities for off-street bike/ped facilities – around 700,000 per year.
- WisDOT also provides TAP funding from a statewide pool of funds.
- $4.05 million per year has been programmed outside of TAP
- On-street facilities are included as part of street projects.

Annual Transit Revenue Estimates ($000's)
for the Madison Metropolitan Planning Area

Bicycle and Pedestrian Facilities	Funding Program	Avg. Annual Funding ($000s)
Off-Street Facilities		
Federal/State Funding	STBG - Transportation Alternatives Program (TAP) Set Aside	$ 746
Local and Other Funding	County PARC & Ride Bicycle Grant Program, Local municipal funding, Other	$ 4,054
Subtotal		$4,800



PROJECTED REVENUES

- Revenue projected for 34-year planning period assuming recent funding levels and inflationary increases of 2% per year
- Overall revenue of 13.3 billion
- Federal and State roadway numbers derived from 6 –year rolling average of expending funds between 2011-2016 obtained from WisDOT
- Local funding estimates based on 5-year rolling average of expended municipal transportation funds from 2010-2014 obtained from Wisconsin Department of Revenue
- Metro revenues based on 5-year rolling average from 2011-2015 NTD reports.
- Bike/ped funding based on recent and currently programmed projects.

Estimated Transportation Revenue, 2017 - 2050 ($000's)
for the Madison Metropolitan Planning Area

Source	2017-2020	2021-2035	2036-2050	Total
Roadway Construction				
State Highways				
Federal/State Funding	$270,505	$1,269,419	$1,708,470	$3,257,394
Local Roadways				
Federal/State Funding	$96,139	$436,633	$587,650	$1,120,423
Local Funding	$180,002	$817,509	$1,100,259	$2,097,770
Subtotal of Local Roadways	***$276,142***	***$1,254,142***	***$1,687,910***	***$3,218,193***
Subtotal of Roadway Construction	**$555,647**	**$2,523,560**	**$3,396,380**	**$6,475,587**
Roadway Maintenance and Operations				
State Highways				
Federal/State Funding	$31,855	$144,673	$194,710	$371,238
Local Roadways				
Federal/State Funding	$24,048	$109,216	$146,990	$280,254
Local Funding	$209,560	$951,750	$1,280,930	$2,442,239
Subtotal of Local Roadways	***$233,607***	***$1,060,966***	***$1,427,920***	***$2,722,493***
Subtotal of Maintenance and Operations	**$265,462**	**$1,205,638**	**$1,622,630**	**$3,093,731**
Metro Transit				
Capital				
Federal Funding	$20,583	$93,481	$125,813	$239,877
Local Funding	$5,146	$23,370	$31,453	$59,969
Subtotal of Capital	***$25,729***	***$116,851***	***$157,266***	***$299,846***
Operating				
Federal Funding	$28,548	$138,929	$207,604	$375,081
State Funding	$78,730	$383,142	$572,538	$1,034,410
Local Funding	$75,587	$367,849	$549,686	$993,122
Farebox	$58,860	$286,445	$428,041	$773,346
Subtotal of Operating	***$241,725***	***$1,176,365***	***$1,757,869***	***$3,175,959***
Subtotal of Metro Transit	**$293,182**	**$1,410,067**	**$2,072,402**	**$3,475,805**
Bicycle and Pedestrian Facilities				
On-Street Facilities	----included as part of street project funding----			
Off-Street Facilities				
Federal/State Funding	$3,136	$14,244	$19,170	$36,550
Local Funding	$16,709	$75,887	$102,133	$194,729
Subtotal of Off-Street Facilities	***$19,845***	***$90,130***	***$121,303***	***$231,279***
Subtotal	**$19,845**	**$90,130**	**$121,303**	**$231,279**
Total Projected Revenue	$1,134,136	$5,229,396	$7,212,716	$13,276,402

PROJECTED EXPENSES

- Expenses for 34-year period are expected to be nearly $12.8 billion.
- Without increases in spending, trend of declining roadway pavement condition will continue.
- For state highway expenses, assumed all funding would be expended as major projects subject of studies (Beltline, I-39/90/94, Stoughton Rd, USH 51) were not included at this time.
- Additional state revenue will be needed to fund all of these major projects.
- There is sufficient funding for identified local arterial construction projects.
- There is sufficient funding for priority regional path projects identified in 2015 Bicycle Transportation Plan.
- Significant increase in transit funding needed to implement recommended regional system.

Estimated Transportation Expenses, 2017 - 2050 ($000's)
for the Madison Metropolitan Planning Area

Source	2017-2020	2021-2035	2036-2050	Total
Roadway Construction				
State Highways	$279,505	$1,269,419	$1,708,470	$3,257,394
Local Roadways	$263,269	$1,228,992	$1,724,617	$3,216,878
Subtotal	$542,774	$2,498,411	$3,433,087	$6,474,272
Roadway Maintenance and Operations				
State Highways	$31,855	$144,673	$194,710	$371,238
Local Roadways	$183,788	$857,961	$1,203,957	$2,245,706
Subtotal	$215,643	$1,002,633	$1,398,667	$2,616,943
Bicycle and Pedestrian Facilities				
On-Street Facilities	----included as part of street project funding----			
Off-Street Facilities	$22,783	$80,003	$113,764	$216,550
Subtotal	$22,783	$80,003	$113,764	$216,550
Metro Transit				
Capital Expenses	$25,729	$116,851	$157,266	$299,846
Operating Expenses	$241,725	$1,176,365	$1,757,869	$3,175,959
Subtotal	$267,453	$1,293,216	$1,915,136	$3,475,805
Total Projected Expenses	$833,818	$3,877,630	$5,461,987	$12,783,571

PROJECTED TRANSIT EXPENSES

- Projected transit expenses do not include major capital projects.
- Projected transit expenses would cover less than ½ of estimated operating costs to implement the recommended regional transit system.
- New local funding mechanism would be needed to cover capital projects and operating cost increases.
- Vehicle registration fee not enough, ¼% sales tax would be sufficient, but ½% would act as a safeguard against future state/federal funding instability, and allow shift away from property tax.

Estimated Costs of Needed Transit System Capital Projects

Major Capital Expense	Estimated Cost in Millions
Bus Rapid Transit System with buses and Nakoosa Trailbus storage and maintenance facility	$165
Second satallite bus storage and maintenance facility	$35
Fleet expansion for new all-day service and regional express service	$30
Upgrade standard 40-foot buses to electric buses with some articulated buses	$75
Grand Total	**$305**

Estimated Annual Service Hours for Recommended Regional Transit System

Service Category	Estimated Annual Revenue Service Hours	Estimated Cost in Millions
Existing Metro Transit Service	406,000	$55
Bus Rapid Transit	104,000	$14
New All-Day Service	88,000	$12
Frequency Improvements	7,000	$1
Regional Express Service	56,000	$8
Grand Total	**661,000**	**$90**

Estimated Annual Revenue Generated from New Taxing Authority

Revenue Source	Estimated Cost in Millions
RTA - ¼ % Sales Tax	$23
RTA - ½ % Sales Tax	$46
Vehicle Registration Fee - $20 per year	$8

For more information on the Regional Transportation Plan and to review the draft plan, please visit

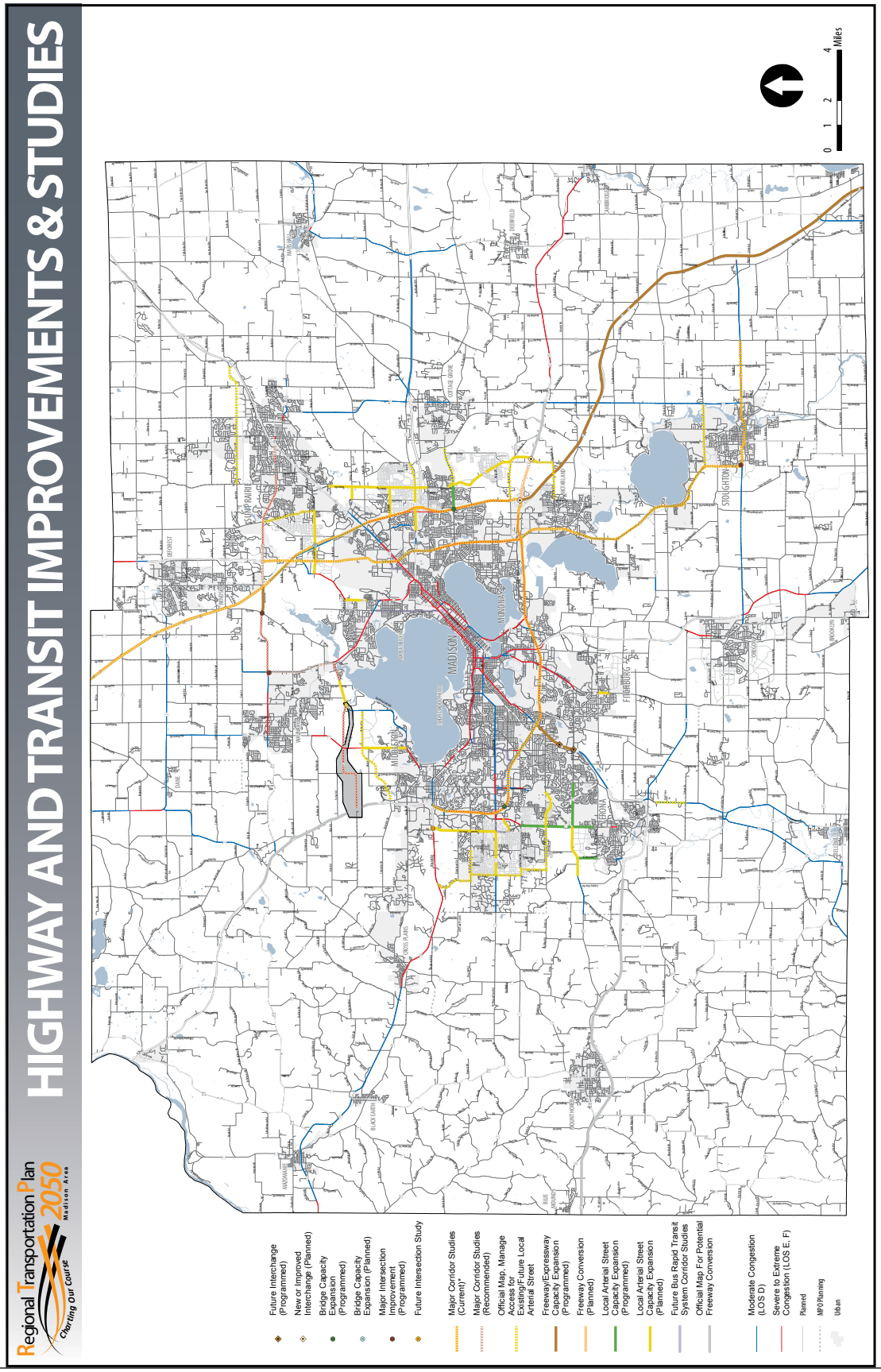
www.MadisonAreaRTP.com

Written comments on the draft plan will be accepted through Wednesday, March 22, 2017. Comments may be provided via the RTP website or via email/mail to the project contact.

PROJECT CONTACT

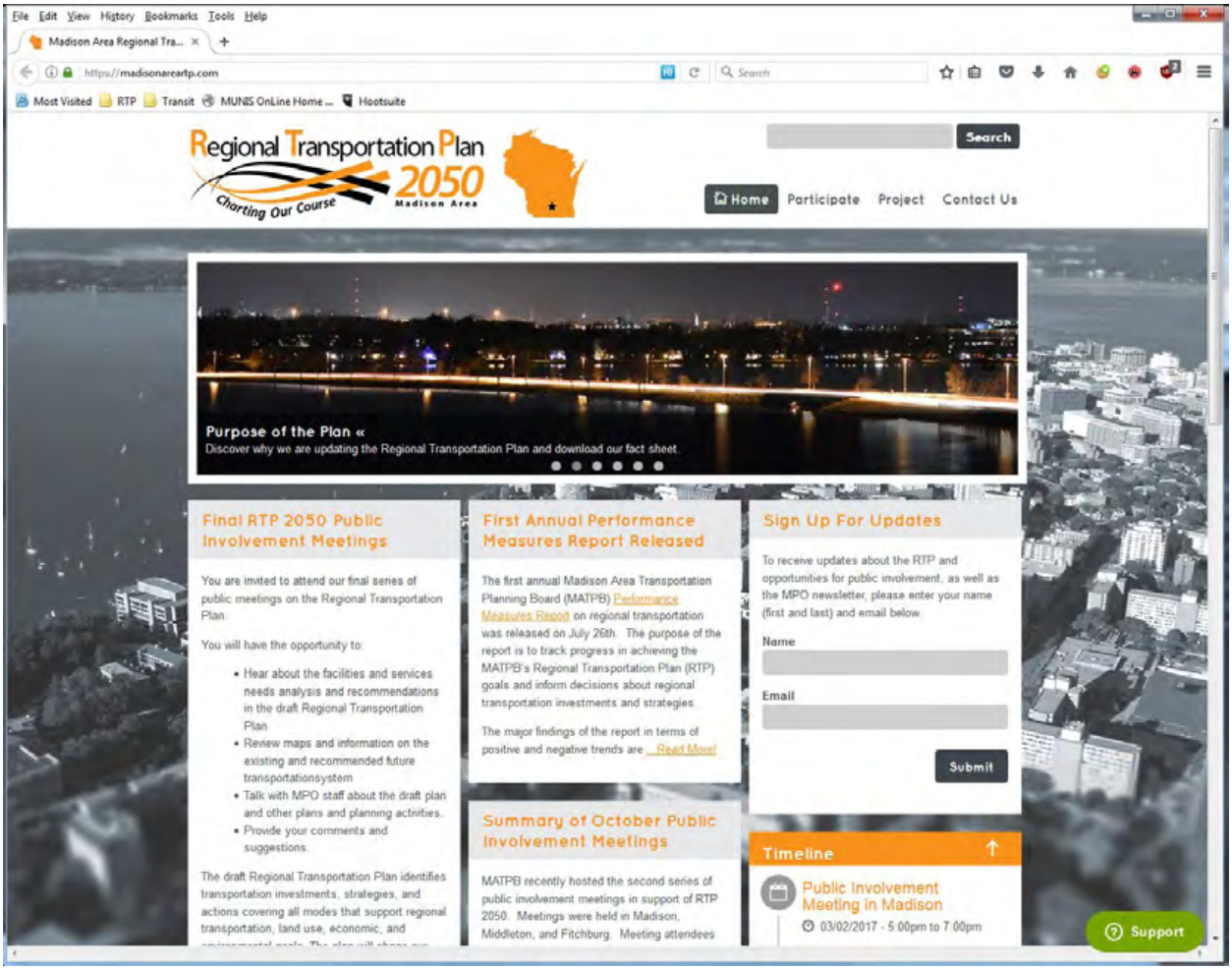
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Regional Transportation Plan 2050 Madison Area
Charting Our Course


Regional Transportation Plan 2050
Madison Area
Charting Our Course
HIGHWAY AND TRANSIT IMPROVEMENTS & STUDIES
MADISON
0 1 2 4 Miles
Future Interchange (Programmed)
New or Improved Interchange (Planned)
Bridge Capacity Expansion (Programmed)
Bridge Capacity Expansion (Planned)
Major Intersection Improvement (Programmed)
Future Intersection Study
Major Corridor Studies (Current)*
Major Corridor Studies (Recommended)
Official Map, Manage Access for Existing/Future Local Arterial Street
Freeway/Expressway Capacity Expansion (Programmed)
Freeway Conversion (Planned)
Local Arterial Street Capacity Expansion (Programmed)
Local Arterial Street Capacity Expansion (Planned)
Future Bus Rapid Transit System Corridor Studies
Official Map For Potential Freeway Conversion
Moderate Congestion (LOS D)
Severe to Extreme Congestion (LOS E, F)
Planned
MPO Planning
Urban

RTP Website Summary

MATPB envisioned RTP 2050 to have a robust public participation process that included both traditional outreach techniques as well as some newer techniques developed as a result of technological innovation. MATPB enlisted the support of Urban Interactive Studio to develop a website for RTP 2050. The goals for the website were to increase public participation and interest in the planning process. The site was to accomplish these goals using a combination of an interactive web portal and innovative web-based applications.



MadisonAreaRTP.com as it appeared on 3/16/2017.

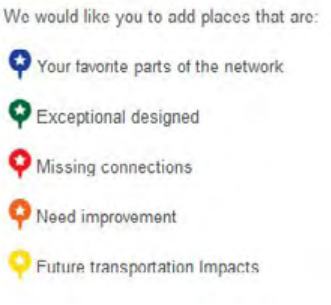
The website, MadisonAreaRTP.com, provided project news, descriptions of the plan development process, a listing of RTP related boards and committees and corresponding membership, a timeline of public engagement activities and meetings, links to related plans and studies, information about MATPB, and interactive tools at specific points in the planning process. Specific tools included on the RTP website included:

- community mapping application
- budget simulator application
- draft chapter comment and review application
- recommendation review application.

MATPB responses to applications are included after the application summary.

Community Mapping Application

The community mapping application gave users the opportunity to let MATPB know what they thought about the area's regional transportation network by placing a pin on an interactive map. Each pin could be one of several colors that corresponded to descriptions of the places being labeled (as shown on the right).



In general, comments on the map were skewed towards areas or transportation features that needed improvement and missing connections to specific places.

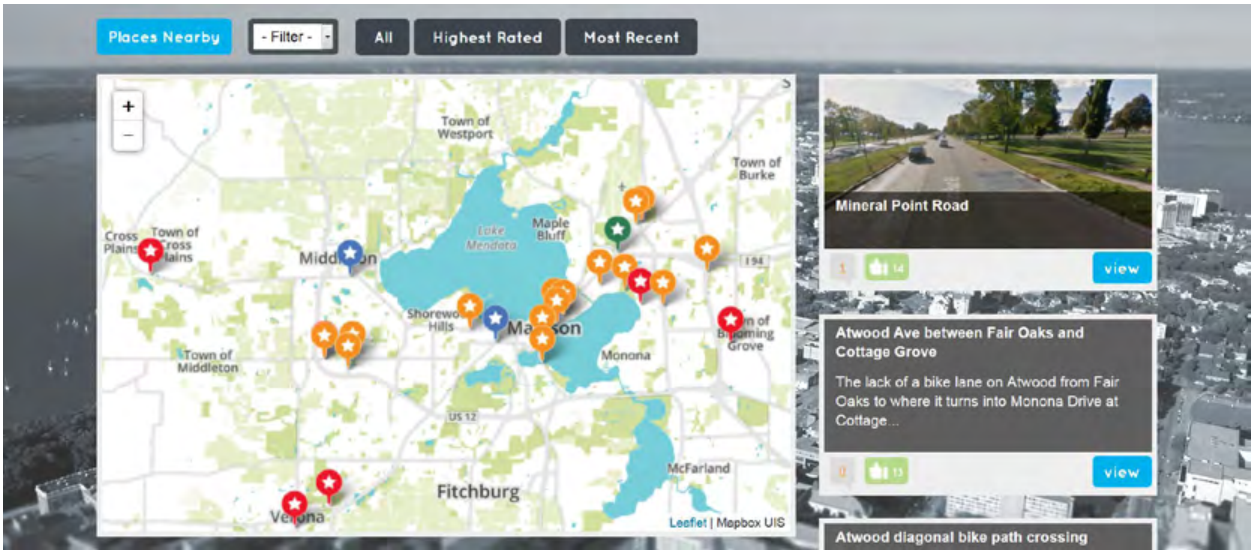


Figure G-1: Comments from Community Mapping Application

Address	Description	Created Date	Total Votes	MPO Response
5622 Milwaukee St, Madison, WI	The bridge is narrow and deteriorating. Heavy traffic frequently uses bridge that connects to residential neighborhoods.	01/26/2016	9	A project to replace the bridge deck and add bike lanes is programmed for 2017-2018.
Aberg Ave, Madison, WI	I appreciate the context sensitive design elements incorporated into this bridge.	01/26/2016	11	Thank you for the feedback.
801 Cottage Grove Rd, Madison, WI	Little signage to notify driver exit is coming. Quick turn requires quick braking.	01/26/2016	9	Thank you for the feedback. The sign has been removed now that the exit has been finished.
1527-1529 Regent St, Madison, WI	This makes me feel much safer when biking in the area.	01/26/2016	10	Thank you for the feedback.
6933-6999 University Ave, Middleton, WI	A convenient bus stop for getting downtown.	01/26/2016	9	Thank you for the feedback.
257 Dunning St, Madison, WI 53704	Appreciate the diagonal crossing with bike signal, it's a big improvement. However, the timing of this light and the one at the Yahara and Williamson often makes it so that when biking eastbound, the car traffic signal turns red before I can get there, and the bike signal does not automatically trigger. If the cross-street (Dunning) can turn green for cars even when no traffic is there, the bike light should automatically trigger as well.	03/02/2016	11	Thank you for the feedback. We have passed this information along to City of Madison Traffic Engineering, as this feedback is too specific for the scope of the regional transportation plan.
3838 Atwood Ave, Madison, WI 53714	The lack of a bike lane on Atwood from Fair Oaks to where it turns into Monona Drive at Cottage Grove is a major missing connection in the bike infrastructure. Traffic travels too fast to make biking in the lane comfortable or safe (thanks in part to the wide lanes and lack of bike lane). With a major dual attraction of Olbrich Park and Olbrich Gardens, I would expect better connections for bicyclists (getting to the Capital City Trail from Monona and Cottage Grove is not well signed, intuitive, or comfortable).	03/02/2016	12	Thank you for the feedback. A project has been programmed for 2020 to reconstruct the roadway and add bicycle facilities.

Address	Description	Created Date	Total Votes	MPO Response
1200 E Verona Ave, Verona, WI	Badger Prairie Needs Network (BPNN), formerly Verona Area Needs Network, is a 501(c)(3) nonprofit organization dedicated to ending hunger and addressing the root causes of generational poverty in the communities we serve. In our 30th year of continuous operation, BPNN provides food assistance to low and very low-income households in the Verona Area School District, including Verona and parts of Fitchburg and Madison. We also offer a free community meal every Saturday from 11:30 - 1:00pm. In 2015, we served an average of 715 individuals each month - translating to over 257,160 meals and almost 8,600 total people served. Most of the households we helped had someone working for wage (65%) but they simply didn't earn enough to make ends meet. The rest were people with disabilities, senior citizens on fixed incomes, and folks who had fallen on tough times or were temporarily unemployed. Almost half (44%) of those BPNN helped feed were children. We currently operate a food pantry, Saturday meal site, nutrition center (with a commercial-grade kitchen), and gardening program. In August 2015, we moved to a larger, more accessible facility owned by Dane County at the Badger Prairie Health Care complex on the far east side of Verona. This move allows us to share space with the Joining Forces for Families social worker, the 18-21 year old transition program from the high school, and provide a convenient location for other groups and organizations focused on eliminating hunger and homelessness, improving the health and overall wellness of our community, and helping people get back their feet.	03/03/2016	9	Thanks for letting us know about this missed connection. Have have passed this information along to Metro for consideration.
108 Paoli St, Verona, WI	The Verona Senior Center is a Department of the City of Verona, which provides many vital services to area seniors such as: • Nutritious meals on site • Home delivered meals • Transportation • Case management and referrals to service providers • Health monitoring • Support groups	03/03/2016	9	Thanks for letting us know about this missed connection. Have have passed this information along to Metro for consideration.
510-514 S Gammon Rd, Madison, WI	I live near West Towne Mall, but I avoid biking to shops in and near the mall because there are no good bike lanes on Gammon road between the Mineral Point intersection and just north of Elver Park. Traffic is high-volume and fast, and I do not feel comfortable biking in the rightmost lane. I see many high school students and workers biking on the sidewalk, but the entrances and exits to the malls and shops make this tricky. I would love to see an easier bike route to West Towne and the surrounding area, and I think this would be widely used.	04/12/2016	9	Thanks for your feedback. This connection will be made as part of he planned West Towne path. Please take a look at the planned bicycle facilities map for more information.
7718 Mineral Point Rd, Madison, WI	This corner has no sidewalk along portions of Mineral Point and High Point Roads. As a result, I have seen many people, including elderly walkers and parents with strollers, walking in the bike lane on both Mineral and High Point Roads to get to the next stretch of sidewalk. This is very dangerous- I often see cars swipe very close to these walkers.	04/12/2016	9	Thank you for your feedback. This area has been included as a Tier 1, or high-priority, sidewalk need in the plan.
6801 Mineral Point Rd, Madison, WI	"The current design of Mineral Point Road, while theoretically bike-friendly, is actually very uncomfortable to bike. Cyclists avoid biking in the ""bus, bike, and right-turn only"" lanes because they end up blocking buses and dealing with aggressive drivers who do not pay attention when they are merging into the right turn lane. This may be a pie-in-the-sky idea, but I think Mineral Point is an ideal candidate for protected bike lanes from approximately Whitney Way to Junction Road. I know many people who would love to bike to local businesses, but find Mineral Point too daunting to tackle. In addition, there are few parallel side streets that provide the same access and continuous commute. I think that installing protected bike lanes for this stretch of Mineral Point would dramatically improve Madison's bike infrastructure. An infrastructure project that placed protected bike lanes on Mineral Point and Gammon, combined with the West Towne Path, would really make the far west side a desirable and healthy place to live, and would place Madison on the map as an exceptionally bike-friendly city."	04/28/2016	12	Thank you for your feedback. Thanks to your feedback, we have identified this route as an area that needs a bicycle facilities. Please be aware that this route has also been identified as a potential BRT corridor. This may lead to any new facilities being off-street, such as a multi-use path to minimize conflict with bus lanes.

Address	Description	Created Date	Total Votes	MPO Response
409 S High Point Rd, Madison, WI	Cars traveling north on High Point Rd wanting to make a left turn onto Mineral Point Rd often have to do so blindly -- sight lines of incoming traffic are very poor. I propose adding a dedicated left turn signal to improve vehicle safety.	05/17/2016	6	Thank you for the feedback. We have passed this information along to City of Madison Traffic Engineering, as this feedback is too specific for the scope of the regional transportation plan.
901 University Ave, Madison, WI	Very difficult to cross from the eastbound protected bike lane to Park Street and campus across University.	06/22/2016	4	Thank you for the feedback. We have passed this information along to City of Madison Traffic Engineering, as this feedback is too specific for the scope of the regional transportation plan.
703 University Ave, Madison, WI	Very difficult to cross from the eastbound protected bike lane to Lake Street and campus across University.	06/22/2016	4	Thank you for the feedback. We have passed this information along to City of Madison Traffic Engineering, as this feedback is too specific for the scope of the regional transportation plan.
1-7 John Nolen Dr, Madison, WI	This intersection is a mess for vehicular, bicycle, and pedestrian traffic. Reconfiguring the intersection and replacing it with a (possibly signalized) roundabout would improve it considerably. Bicycle and pedestrian overpasses may also be appropriate.	06/22/2016	6	Thank you for your feedback. This area was identified in the plan as a high-conflict intersection. There is currently an on-going study examining potential solutions for the area.
900-916 S Whitney Way, Madison, WI	Bike/Ped Infrastructure along Whitney Way, particularly crossing under the Beltline, is in need of repair and upgrades.	06/23/2016	4	Thank you for your feedback. This area has been included in the plan as a major bicycle/pedestrian barrier needing improvement.
3513 Anderson St, Madison, WI	Missing bike lanes from Wright St. to US-51.	07/08/2016	6	Thank you for your feedback. This route has been idenfied in previous planning efforts as needing a bicycle facilities. This facility is programmed as a project to add bicycle lanes for 2020.
3700 Lien Rd, Madison, WI	Major through connection is through PDQ parking lot. Unsafe for everybody involved, I'm surprised there aren't more accidents here.	07/08/2016	5	Thank you for the feedback. We have passed this information along to City of Madison Traffic Engineering, as this feedback is too specific for the scope of the regional transportation plan.
3301 Atwood Ave, Madison, WI	Bike lanes or side path needed on Atwood Ave. at least between Oakridge Ave. and Cottage Grove Rd. Opportunity to improve connection between Olbrich Park near the lake and the Capital City Bike Path	07/08/2016	6	Thank you for your feedback. This route has been programmed for reconstruction in 2020 in a project that will include new bicycle facilities at that time.
Capital City Trail, Madison, WI	Every street crossing on the bike path here is rough and cross traffic slows down cyclists trying to commute. Opportunity to grade the bike path consistently, close off some cross streets that are unnecessary or have the bike path serve as a speed bump slowing traffic down on some of these streets. Until improvements are made here, cyclists will continue to use Williamson St. to commute.	07/08/2016	6	Thank you for the feedback. We have passed this information along to City of Madison Traffic Engineering, as this feedback is too specific for the scope of the regional transportation plan.
1145 Williamson St, Madison, WI	Bike lanes missing from Williamson St. Did city planners not think people would be using this route to get around by bike? Did they not think cyclists would have destinations on Willy St.?	07/08/2016	4	Thank you for the feedback. While we agree that Williamson Street would serve as a direct route and has a number of destinations that bicyclists are interested in, right-of-way constraints were the reason that facilities were not added.
4091 Underdahl Rd, Madison, WI	Family-friendly bike route needed between Madison and Cottage Grove. CTH-BB is unacceptable. Do whatever is needed to complete that flagship gap. The city and county claims this is a high priority gap, but the railroad is being uncooperative. The RTP should put some heat on the railroad to get them to be more cooperative.	07/15/2016	7	Thanks for taking the time to provide feedback. A new bike route is programmed to be constructed in 2019 by Dane County.
8206-8258 US-14, Cross Plains, WI	Safe bike route needed paralleling US-14 through Black Earth Creek communities. I do not want to hear about any more fatal bike-vs-car accidents along this route.	07/15/2016	5	Thank you for providing feedback. The planned good neighbor trail will provide parallel access to this route. Communities along this corridor have been constructing the path; however, funding for the entire trail has not yet been identified. You may review the plan, and see the route it will take, here. https://www.cityofmadison.com/bikemadison/documents/GoodNeighborFinal.pdf. We will forward your feedback along to Dane County and WisDOT.

Address	Description	Created Date	Total Votes	MPO Response
6262-6324 US-12, Dane, WI	US-12 side path has 6 mile gap, the bridge for it was installed with reconstruction of the highway. At one point a Dane County Sheriff told me (incorrectly) that it was illegal to bike on the road between this missing path. This should have been done with the reconstruction of the highway. Disappointed that it was not.	07/15/2016	4	Thank you for your comment. Unfortunately the specified area is outside of MATPB planning area so it is not specific identified in this plan. There have been prelimiary discussions about bridgiing the gap between the two paths, connecting the Madison Area to Devil's lake. That being said, a project lead and/or funding mechnisms to complete the project have not been identified as of now. We will forward your feedback along to both WisDOT and Dane County.
1202 Spring St, Madison, WI	The redone intersection is fantastic. For commuters by bicycle it is important that we get intersection priority across lower traffic streets. If we are forced to slow or stop for too many intersections, or if crossings at speed are too rough we are likely to take an alternate street route. This is the main reason you see many commuters on Williamson St. over the bike path, you end up slowing down a lot on the path and every crossing features two very rough bumps.	07/28/2016	4	Thank you for the feedback. We have passed this information along to City of Madison Traffic Engineering, as this feedback is too specific for the scope of the regional transportation plan.
301 State St, Madison, WI	The traffic signals on State Street are obviously set up for vehicular traffic crossing at Gorham, Johnson (and also Dayton/Fairchild). However, this results in buses, cyclists, and pedestrians queuing on State Street for far too long.	08/05/2016	4	Thank you for the feedback. We have passed this information along to City of Madison Traffic Engineering, as this feedback is too specific for the scope of the regional transportation plan.
611 Highland Ave, Madison, WI	Very tough to cross Highland on a bicycle. Traffic is either moving on Highland or traffic from the Campus Dr. offramp is turning onto Highland. Further, as this is the main entrance to the VA Hospital, there are a number of out-of-town residents not used to Madison traffic, as well as many elderly drivers. A ped/bike overpass or a all-stop signal for ped/bike crossing are necessary.	08/05/2016	5	Thank you for the feedback. We have passed this information along to City of Madison Traffic Engineering, as this feedback is too specific for the scope of the regional transportation plan.
Campus Dr, Madison, WI	AM westbound traffic on Campus is notoriously congested. If there was a dedicated right turn lane, it could filter hospital traffic out onto University Bay and improve through-traffic for the remaining westbound vehicles.	08/05/2016	4	Thank you for the feedback. We have passed this information along to City of Madison Traffic Engineering, as this feedback is too specific for the scope of the regional transportation plan. There is, however, a project planned to reconstruct University Ave between University Bay and Shorewood Drive that may address some of these issues.
5701 Old Sauk Rd, Madison, WI	I propose adding a left turn lane for bikes to get from Old Middleton onto Old Sauk. During busy times I have seen bike waiting in line with cars to turn left. I dont think they should need to do that. What I do is go up to the stop sign in the right lane and then turn left. The Left lane could be made a left turn only lane (not sure why it is not now as I never see anybody going straight from the left lane but they could) and a bike turn lane could be added to the right lane with markings indicating that cars going straight and bike share that lane. Take out the awkward median on the northwest side of the intersection to make way for the bike turn. Add a stop or remove the special turn lane from Old Middleton heading south to turn right on Old Sauk that is currently a yield.	08/10/2016	4	Thank you for the feedback. We have passed this information along to City of Madison Traffic Engineering, as this feedback is too specific for the scope of the regional transportation plan.
525-549 N Whitney Way, Madison, WI	The updated intersection at Old Middleton, Eau Claire and the Black Hawk bike path is fine but what would make it rock is to let bikes go first at the Old Middleton intersection with Whitney Way heading East towards Black Hawk path. If you are at this intersection waiting for the light to turn green most likely there is a long line of cars also waiting. When you get to the section of Old Middleton that squeezes down to one lane and allows bikes to take the lane it is usually hard to do so with the car traffic being heavy. A bikes first light at Old Middleton-Whitney Way would allow bikes to get a head start and establish lane position so it easier to make the left turn onto Black Hawk without dealing with a lot of car traffic trying to go straight. The other signals could be coordinated to let cars turn left from Old Middleton to Whitney or Whitney to Old Middleton while the light is green for bikes only to go straight. Currently cars turning left from westbound Old Middleton to Whitney Way usually get to go first.	08/10/2016	4	Thank you for the feedback. We have passed this information along to City of Madison Traffic Engineering, as this feedback is too specific for the scope of the regional transportation plan.
381-399 S Broom St, Madison, WI	This is an important crossing for bicyclists that is currently lacking an adequate crossing. Broom St. also has no bike lanes from here to Doty. Lots of room for improvement!	08/31/2016	5	Thank you for the feedback. We have passed this information along to City of Madison Traffic Engineering, as this feedback is too specific for the scope of the regional transportation plan.

Address	Description	Created Date	Total Votes	MPO Response
699 E Washington Ave, Madison, WI	Current setup makes it extremely difficult for pedestrians to cross E. Washington here. Motorists completely disregard their obligation to stop for pedestrians here. Good improvements would be first signing with ""State Law Yield to Peds"" then adding flashing lights like some bike path crossings. Crossing this street at rush hour as a pedestrian is virtually impossible as the flow of traffic on Washington never stops, and they never stop for pedestrians ready to cross.	08/31/2016	5	Thank you for the feedback. We have included a pedestrain toolbox for communities to utilize to address issues such as this one. Regarding this specific issue, we have passed this information along to City of Madison Traffic Engineering, as this feedback is too specific for the scope of the regional transportation plan.
6169 McKee Rd, Fitchburg, WI	Traveling east or west on McKee Road to get to grocery stores, movie theaters, or the drug store is a pretty risky venture. This area needs real attention to solve some real threats to people traveling by bike and walking.	09/16/2016	4	Thank you for your feedback. We have idenified McKee Road as a corridor in need of improved bicycle facilities.
3005 Syene Rd, Madison, WI	This used to be an accident waiting to happen ... until several days ago when a person crossing this blind intersection on her bicycle was struck by a person driving a van. The cyclist went down and sent to the hospital--still in ICU :(The blind spot is located at the Capital City Trail where it crosses Syene Road, just north of the McCoy & S. Syene Road intersection. It is nearly impossible to see bicyclists coming out from the trail traveling west, and is just as difficult to see cars from the left side coming off McCoy who are traveling north on to Syene Road. Lights / speed bumps / paint!!!	09/16/2016	4	Thank you for your feedback. Individual intersection improvements are outside of the scope of the regional plan; however, we have passed your feedback on to the City of Fitchburg Public Works department.
332 Capital City Trail, Madison, WI	The narrow grass buffer between the bike path and the busy road with fast moving cars makes this less comfortable and pleasant than it could be if trees were planted between the path and road. If safety of trees along the road is an issue, a barrier could be placed between the road and trees to prevent collisions.	10/26/2016	5	Thank you for the feedback. We have passed this information along to City of Madison Traffic Engineering, as this feedback is too specific for the scope of the regional transportation plan.
Stoughton Road / Cottage Grove Road Temporary Exit	At least they fixed the SB entrance ramp so that it feeds into a through lane. Before that, it was a "close your eyes and hope" situation. :)	01/28/2016		No response.
Gammon Road	"Just to elaborate further, I think a protected bike lane would be most effective for Gammon road. With the construction of the new West Towne Path, a safe bike lane on Gammon would provide easy access to the path from the mall, Memorial High, surrounding businesses, and local retirement communities. I think it would greatly increase the utility of the path for local neighborhoods. "	04/28/2016		Gammon Road between Mineral Point Rd and Watts Rd is identified as a barrier in need of improved bicycle facilities. The feasibility of a protected bike lane from the West Towne path north to Mineral Point Rd would need to be determined as part of more detailed design work.
Williamson St.	Sorry, this should be “Needs Improvement”	07/08/2016		Thanks, Jim. We've updated this to Needs Improvement. We appreciate your feedback!
Mineral Point Road	It is pretty scary riding a bike on a wide road such as is the case here. It adds to the anxiety when fast motor vehicle traffic is really quite aggressive! I would love to bike this are too as would other folks, including individuals who work in the area.	09/16/2016		The Mineral Point Rd bus/bike lane/right turn lane is not ideal, but works OK for more skilled bicyclists. Consideration of some type of protected on-street bike facility must be balanced against the fact this is a likely BRT corridor. A side path is another possible option, though there are safety concerns with these type of facilities on roadways with more closely spaced access points. There are also plans for parallel routes on either side of Mineral Point, including one to the south through the UW Research Park.

Continued on next page.

Budget Simulator Application

The budget simulator application (right) launched in October 2016. The purpose of the application was to determine the investment priorities of the general public. The application provided generalized existing funging levels for users and allowed for the increase or decrease of funding of a variety of transportation categories including:

- Road/Bridge Maintenance and Safety Improvements
- Roadway Capacity Enhancements
- Intelligent Transportation Systems and Operational Improvements
- Bicycle and Pedestrian Improvements
- Transit Improvements

In addition to funding categories, the application allowed for the generation of additional transportation revenues through a Regional Transit Authority or other local funding source with the following funding levels:

- No additional funding
- $8 million annually ($20 vehicle registration)
- $12.5 million annually (1/8% sales tax or $35 vehicle registration fee)
- $25 million annually (1/4% sales tax)

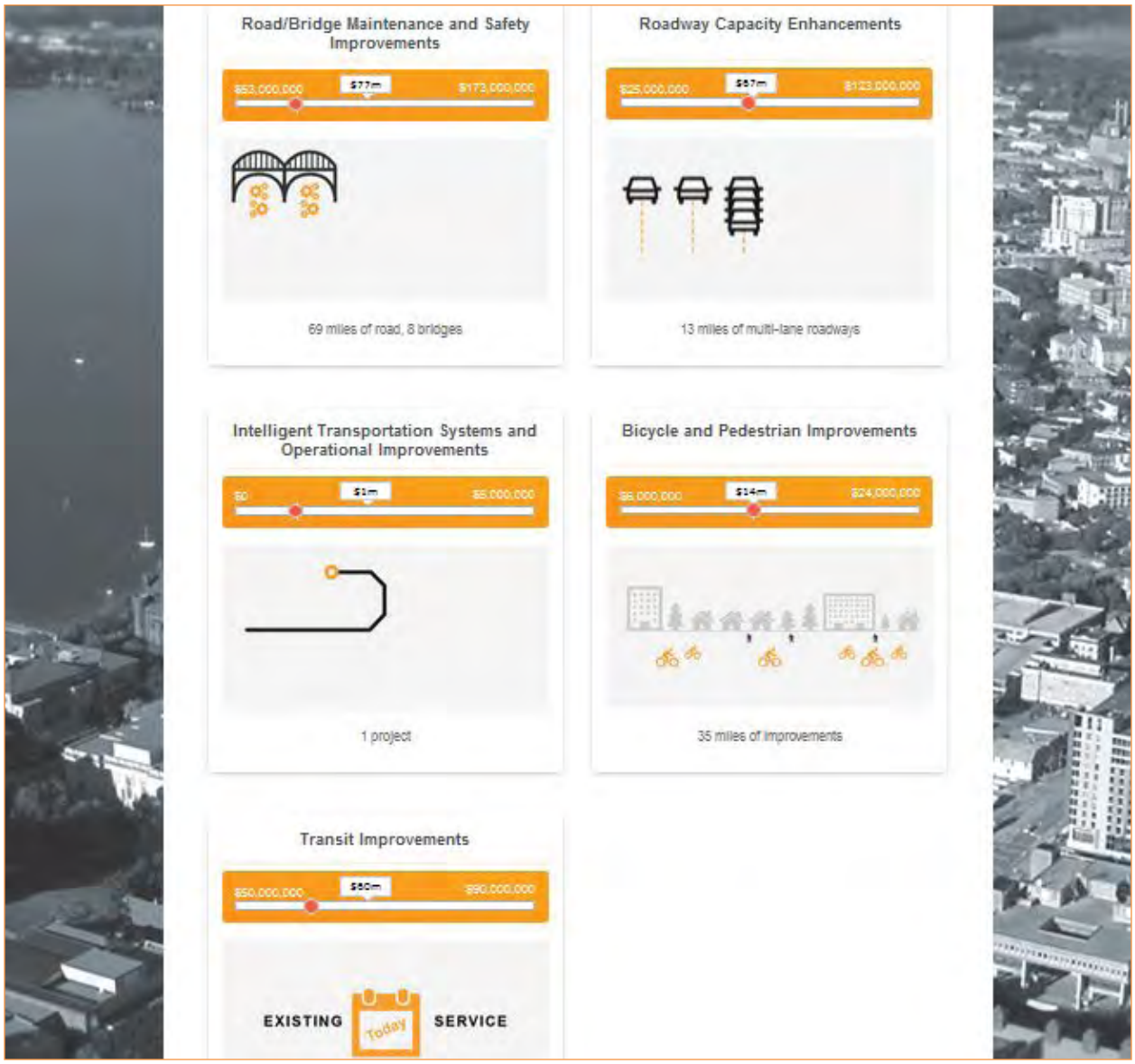
Figure G-2: Responses and Comments from Budget Simulator Application

Time	RTA Funding	Local Funding	Maintenance and Safety Improvements	Roadway Capacity Enhancements	ITS and OPS Improvements	Bicycle and Pedestrian Improvements	Transit Improvements
Defaults	*$0/No additional funding*	*$0 - No additional funding*	*$77,000,000*	*$67,000,000*	*$1,000,000*	*$14,000,000*	*$60,000,000*
10/18/2016	$25 million annually.	$25 million annually.	$113,000,000	$60,000,000	$4,000,000	$22,000,000	$70,000,000
10/19/2016	$25 million annually.	$12.5 million annually.	$77,000,000	$60,000,000	$5,000,000	$24,000,000	$90,000,000
10/24/2016	$25 million annually.	$8 million annually.	$77,000,000	$67,000,000	$1,000,000	$14,000,000	$60,000,000
10/24/2016	$25 million annually.	$8 million annually.	$77,000,000	$67,000,000	$5,000,000	$10,000,000	$90,000,000
10/24/2016	$25 million annually.	$8 million annually.	$65,000,000	$67,000,000	$5,000,000	$10,000,000	$90,000,000
10/24/2016	$25 million annually.	$8 million annually.	$65,000,000	$67,000,000	$5,000,000	$18,000,000	$90,000,000
10/25/2016	$0/No additional funding	$0 - No additional funding	$89,000,000	$46,000,000	$4,000,000	$10,000,000	$70,000,000
10/25/2016	$25 million annually.	$12.5 million annually.	$77,000,000	$53,000,000	$5,000,000	$24,000,000	$90,000,000
10/25/2016	$25 million annually.	$12.5 million annually.	$77,000,000	$67,000,000	$5,000,000	$16,000,000	$90,000,000
10/26/2016	$25 million annually.	$8 million annually.	$77,000,000	$67,000,000	$1,000,000	$14,000,000	$60,000,000
10/26/2016	$25 million annually.	$8 million annually.	$101,000,000	$39,000,000	$2,000,000	$18,000,000	$90,000,000
10/27/2016	$8 million annually.	$25 million annually.	$101,000,000	$25,000,000	$2,000,000	$24,000,000	$70,000,000
10/27/2016	$8 million annually.	$8 million annually.	$89,000,000	$25,000,000	$5,000,000	$24,000,000	$90,000,000
11/2/2016	$8 million annually.	$0 - No additional funding	$77,000,000	$46,000,000	$2,000,000	$22,000,000	$80,000,000
11/30/2016	$12.5 million annually.	$12.5 million annually.	$101,000,000	$46,000,000	$2,000,000	$22,000,000	$70,000,000
12/7/2016	$25 million annually.	$25 million annually.	$89,000,000	$67,000,000	$5,000,000	$18,000,000	$90,000,000
12/12/2016	$12.5 million annually.	$12.5 million annually.	$77,000,000	$60,000,000	$4,000,000	$22,000,000	$80,000,000
1/31/2017	$8 million annually.	$12.5 million annually.	$89,000,000	$53,000,000	$5,000,000	$22,000,000	$70,000,000
2/1/2017	$0/No additional funding	$0 - No additional funding	$53,000,000	$67,000,000	$3,000,000	$24,000,000	$70,000,000
2/1/2017	$25 million annually.	$25 million annually.	$77,000,000	$102,000,000	$5,000,000	$24,000,000	$60,000,000
2/6/2017	$8 million annually.	$0 - No additional funding	$77,000,000	$25,000,000	$4,000,000	$20,000,000	$80,000,000
2/15/2017	$25 million annually.	$25 million annually.	$89,000,000	$67,000,000	$5,000,000	$18,000,000	$90,000,000
2/15/2017	$12.5 million annually.	$25 million annually.	$77,000,000	$60,000,000	$5,000,000	$24,000,000	$90,000,000

Time	RTA Funding	Local Funding	Maintenance and Safety Improvements	Roadway Capacity Enhancements	ITS and OPS Improvements	Bicycle and Pedestrian Improvements	Transit Improvements
3/3/2017	$25 million annually.	$25 million annually.	$101,000,000	$88,000,000	$4,000,000	$16,000,000	$60,000,000
3/3/2017	$25 million annually.	$25 million annually.	$101,000,000	$95,000,000	$2,000,000	$10,000,000	$60,000,000
3/3/2017	$25 million annually.	$25 million annually.	$101,000,000	$95,000,000	$5,000,000	$18,000,000	$50,000,000

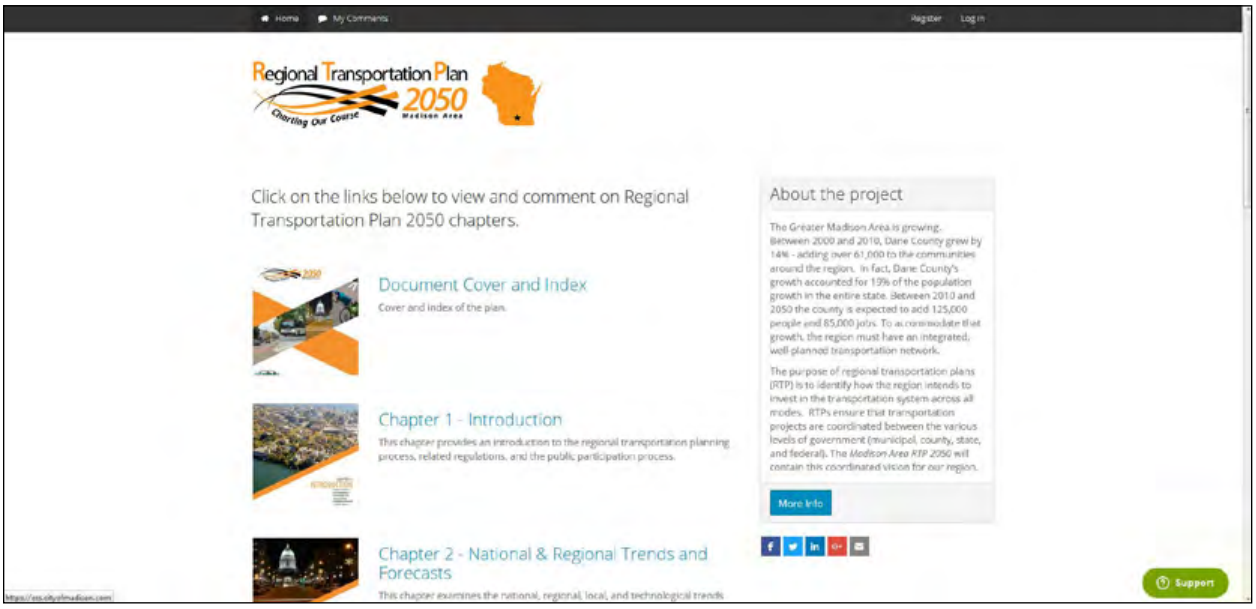
Time	Do you have any comments on regional transportation funding or the budget simulator?
2/15/2017	This was a neat exercise. I'm all for expanding funding for modes other than the automobile

In general, respondents were supportive of both a RTA and other locall funding option (option for all modes), with more supporting a 1/4 sales tax for an RTA than a local funding option. Vehicle registration fees were more popular for a local funding option than as a means for funding an RTA. Respondents were supportive of increases in funding for maintenance and safety improvements, ITS, bicycle and pedestrian improvements, and transit improvements. Respondents believed that roadway capacity enhancement funding was adequate at existing levels.



Draft Chapter Review

The Draft Chapter Review application provided a method of reviewing PDFs of chapter drafts online while providing feedback directly on the PDF. Chapters were uploaded to the tool as they became available. Unfortnuately, no comments were received using this tool.



Recommendations Review

The Recommendations Review application allowed users to review draft project recommendations by mode and provide feedback via a feedback form to MPO staff. Transit, bicycle, pedestrian, and streets and highways recommendations were included as a part of the tool, with roadway recommendations receiving updates before the third series of involvement meetings.

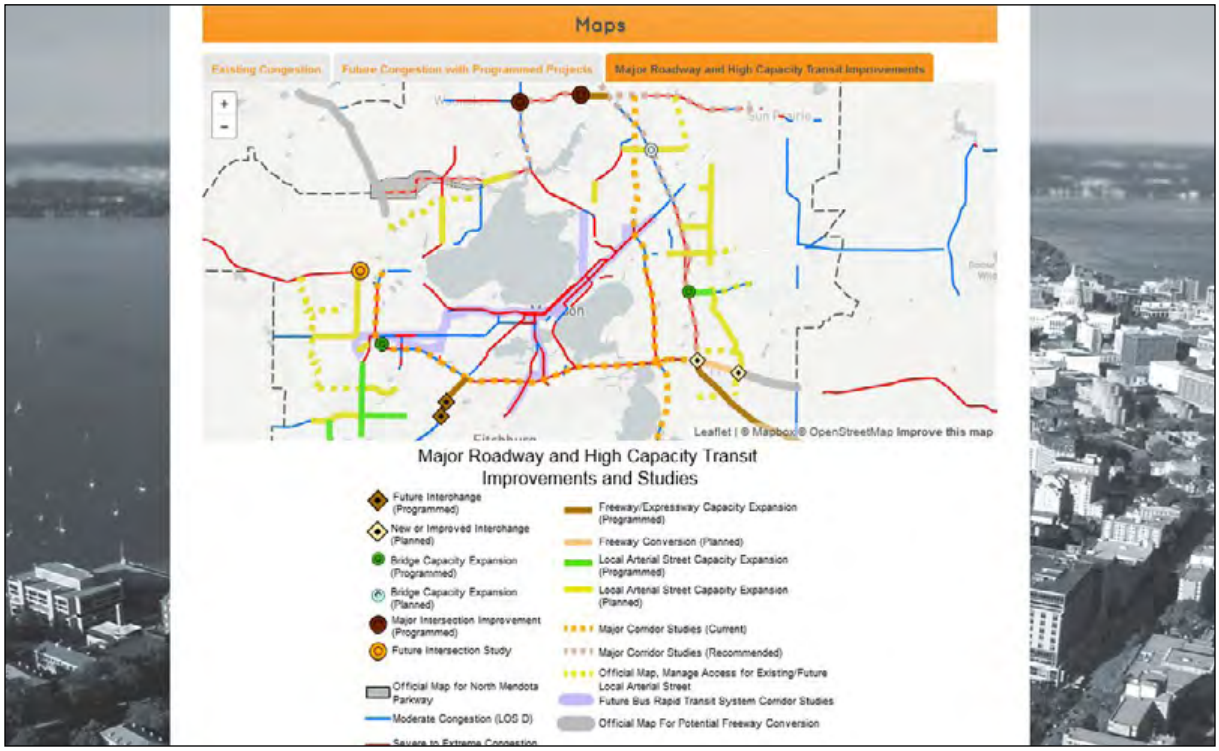


Figure G-3: Comments from Recommendations Review

Time	Your Comments	MPO Response
10/25/2016	No BRT service to the airport, American Family or Epic all seem like big missed opportunities. And no improved service to the airport is baffling. What is the precedent for large companies like Epic and American Family to contribute to costs? Certainly it can be cheaper than building more parking decks, and it's an amenity to attract employees. That being said, I do applaud this plan for weaving BRT in with planned parking infrastructure. This is the key to keep more cars out of the city. I also applaud BRT through South Park Street-- an area of the city that needs better rapid transit. But I'm disappointed to see the Verona Road corridor left out. Madisonians on solid financial footing can benefit greatly from BRT. But our impoverished neighbors *need* better transportation across the city. A BRT system in Madison that doesn't acknowledge its potential to solve our severe equity issues is a system that misses so much potential."	Thank you for the feedback. BRT service will be fast and frequent, serving as a backbone for local routes such as those that connect to major destinations like the ones that you mentioned. The airport, Epic, and American family do not have sufficient all-day ridership to support a service such as BRT; however, each destination would receive improved service as a result of being connected to the BRT via a transfer. For example, that top stop at the airport has, on average, 25 boardings per day, while the top stop near American Family recieves less than 10. East Towne, in constrast, has nearly 600 boardings per day. Epic has around 230, however, these are concentrated during the peak periods and well served by existing express service (75, 55). Both Epic and hospitals near American family contribute to their communities in an effort to offset costs of providing transit service. While the Verona Road corridor is not directly served by BRT service, serivce in the area will be greatly enhanced under a fully-built out system. Routes in the cooridor go to either the West or south transfer points - areas that will be served by BRT. This will allow for a transfer from the local system to the BRT system. A BRT study will kick off in the next year. We encourage you to take part and participate in the process to ensure that your input is considered as routes are finalized and a demonstration line is selected.
10/25/2016	The bike route maps are missing the Kendall-Bluff bike boulevard, and the Dayton Street bike lanes.	Thank you for your feedback. This issue will be corrected in the RTP.
10/25/2016	The proposed BRT service and routes need to be evaluated regarding the addition to local street and neighborhood air pollution. Diesel buses (which are proposed, the last time I saw any detail at all about this) are still very highly polluting. It would be better to reinstate the fast, light regional rail service that had been proposed in the early 1990's. Madison now has a large generation capacity of natural gas-fired electricity, and this cleaner energy can be used to power a rail transit system. Energy needs can be supplemented by wind-generated electricity on many days, as well, further increasing the public health benefits. This form of public transit is very popular throughout much of Europe. Also, there is a substantial bottleneck at rush hour along Campus Drive, especially in winter, with the least little bit of snow. One evening I got off a west-bound bus at the last stop before Breeze Terrace, because traffic was at a crawl. I walked down Kendall and when I got to Farley, I saw my bus just getting to the intersection at University Bay Drive. That situation does not bode well for any kind of rapid bus service. Is there a plan to further widen Campus Drive and create severe impacts to the Regent Neighborhood, in order to provide a dedicated BRT lane?? It would be far better to use the existing rail line, and whatever extension and second-tracking would be needed, to provide fast, safe and health-improving transit service. The draft document needs to include a thorough pollution/public health analysis, and a gridlock/traffic delay analysis of using light rail instead of diesel buses. Because air quality standards are NOT adequate to protect the health of residents in the university Avenue corridor, a lower limit needs to be used in making any public health assessment. I would be happy to provide information regarding the inadequacy of existing standards at protecting public health - especially regarding children and the elderly.	Thank you for your feedback. MATPB recommends preserving the right of way of rail corridors for future light rail service; however, without a local funding mechinism such as an RTA, funding a system is not likely in the near future. An upcoming BRT study will dive deeper into issues related to the system, including environmetal impacts and route selction. Further studies will determine exact stop locations and designs as well as traffic impact. University Avenue west of University Bay is scheduled for a reconstruction in the next few years. Though this is occuring, it will not be expanded to accommodate an additional travel lane. BRT service will likely exist as a shoulder running service in existing right-of-way; however, signal prioritization and other operational improvements have the potential to reduce bottlenecks in the area and improve transit (and automobile) travel times and reliability. Minor shoulder widening may occur as right-of-way allows, but nothing as been determined as of yet.
2/15/2017	If Madison is considering a BRT please look at the success of the fairly new BRT in Connecticut, CT Fastrak . http://ctfastrak.com/	Thank you for for the feedback. We will take a look at the BRT system in Connecticut. BRT implementation will soon be entering a new phase. Please keep an eye out for future opportunities to engage in the process.

Responses to Other Comments

MATPB recieved comments via email, in addition to those recieved through RTP 2050 website-based application:

Public Comments: Fish Hatchery Road, 2/22/2017: (What is happening on Fish Hatchery Road south of Madison, Wisconsin is happening all over America. A county highway which once served mainly as a farm-to-market road has become a major commuter route into a metropolitan center for outlying village residents and exurbanites. It is special to me because my wife's family farm is located on it. It is special to me because I have planted trees along that road, and I want to believe they will grow old.)

There is no other solution than for Fish Hatchery Road to become another Beltline.

There is no other solution than for the land to become gas stations and shopping centers and golf courses and many more Country Estates for many more people who drive somewhere else for almost everything, five or ten trips per household per day.

There is no other solution, that is, if as many of us continue to drive here as often as we do, almost always by ourselves.

It does not matter one whit whether we say we do not want this beautiful, fertile farmland to be paved over. It does not matter that we say we oppose the Dakota Access Pipeline. It does not matter that we go to Metropolitan Planning Commission meetings and paste brightly colored dots on maps.

All that matters is traffic count. Which is to say, how often you and I and our neighbors drive here. Click click. Click click.

When our clicks reach a certain number, the Wisconsin Department of Transportation will step in and say Fish Hatchery has to be made into a four-lane or six-lane divided highway. They will go through the motions of acting like they want public input and then they will ignore it entirely.

The guys who drive bulldozers and mix concrete and weld snow plows will be happy. The guys who sell gas and cars will be happy. The guys who subdivide land and become rich will be happy. The guys who build houses will be happy. The guys who construct shopping malls will be happy. The guys who manufacture riding lawn mowers will be happy. The government will be happy for the additional taxes. The happiness of all these people requires another Beltline, and another, and another.

All that is needed for all of this to happen automatically is for most of us to continue to think the way we have been thinking,...and to continue to live the way we have been living.

Including my own family. Including my friends and neighbors. Including me, having no idea what I can say or do that will make any difference.

MPO Reponse: *Thank you for taking the time to write us. There are currently to plans to convert Fish Hatchery Road into a limited access highway, nor are studies proposed to examine the fesibility of this type of conversion project. Further, MATPB is not currently recommending study of corridor expantion, but rather Bus Rapid Transit (BRT) service from the Beltline to McKee as a congestion management and traffic mitigation measure. Planning for BRT does not stop in between the curbs - land use plans will reflect the fast, frequent transit service, requiring less parking and more density in an effort to support high-frequency transit service. The next phase of the BRT study will kick off in 2017. We encourage you to take part in the planning process to ensure that your feedback about the FIsh Hatchery corridor is taken into account.*

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APPENDIX H: TRAVEL MODEL SUMMARY STATISTICS

Model Summary Statistics

MPO staff ran multiple roadway and transit project scenarios using the Dane County Travel Demand Model (TDM) as part of the plan development process. The final set of scenarios are listed below and depicted in Figures H-1 to H-3.

- 2050 Existing and Committed Projects (Scenario 1)
- 2050 Potential Capacity Expansion Projects (Scenario 2) (Final Plan Scenario)
- 2050 Potential Capacity Expansion Projects (Scenario 3) (Final Plan Plus WisDOT projects)

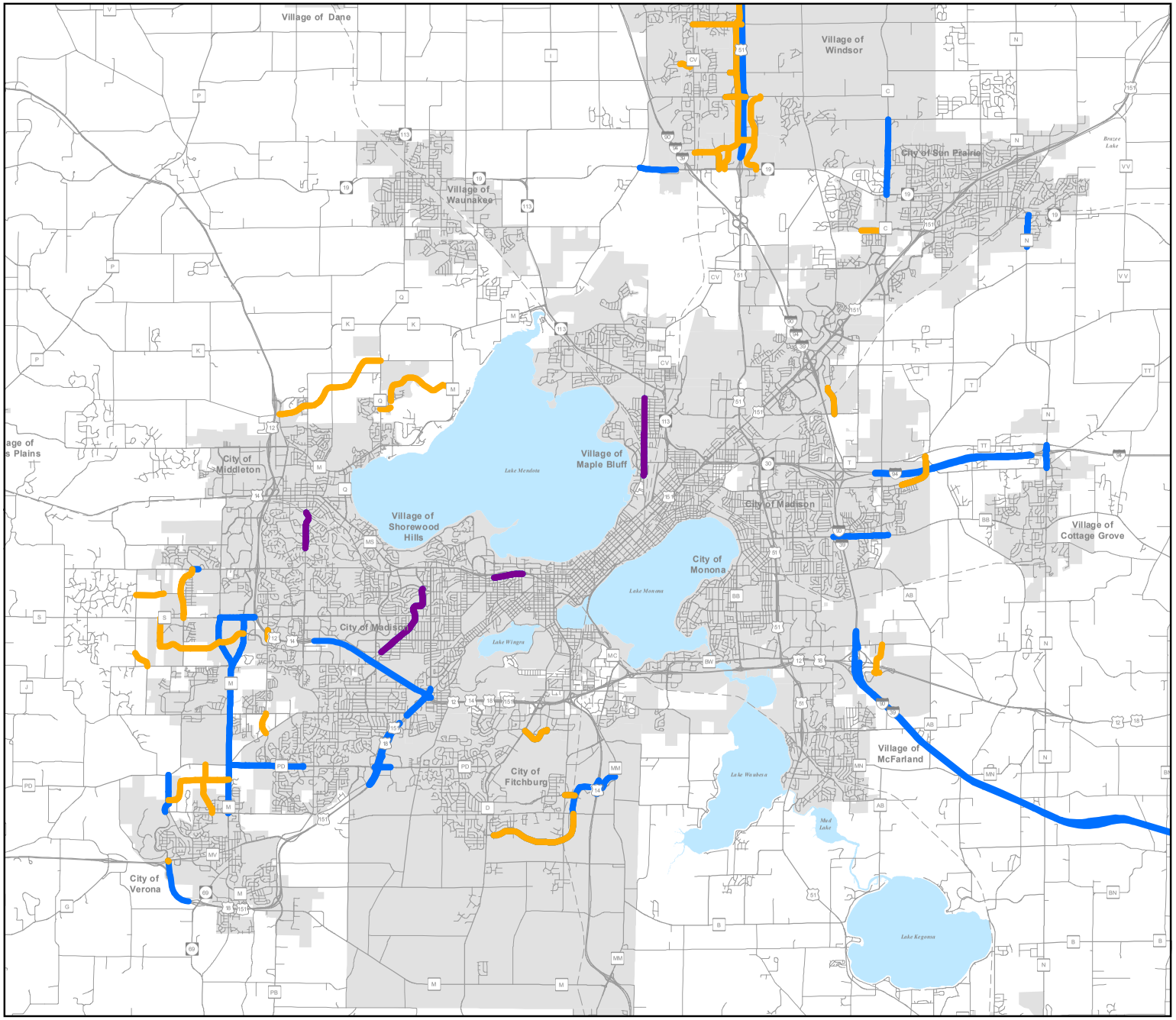
Scenario 1 only includes existing (built after 2010 base year) and committed (programmed) projects and assumes existing Metro Transit service levels. Scenario 2 adds the capacity expansion roadway projects included in the final financially constrained plan along with the transit service improvements (BRT, express commuter service, and other local service improvements and expansion) included in the recommended regional transit system. This system is not part of the financially constrained plan. Scenario 3 contains the Scenario 2 roadway and transit projects plus capacity expansion improvements to Stoughton Road (US 51) and the Beltline (US 12/14/18/151).

Model summary statistics were compiled for the base year (2010) and for each scenario. Vehicle miles traveled (VMT), vehicle hours traveled (VHT) and average vehicle delay are summarized in Figures H-4 to H-6 according to each roadway functional class. Scenario 2, the Final Plan scenario, contains the lowest VMT and VHT figures of any plan horizon year scenario, while Scenario 3 with the WisDOT projects has the lowest average vehicle delay. Scenario 3 has the lowest average vehicle delay due to the Stoughton Road and Beltline capacity expansion projects, which improve the anticipated horizon year levels of service on these heavily traveled highways, but does slightly increase VMT and VHT due to traffic using these now faster routes versus in some cases more direct routes.

Boardings for the AM (6am – 9am), Midday (9am – 3pm), and PM (3pm – 6pm) time periods for each scenario, classified by service type (i.e., BRT, Express, and Standard Local Service), are summarized in Figure H-7 to H-9. Figure H-10 to H-17 denotes total trips, boardings, and the transfer rate for each time period of each scenario. Total boardings and trips will increase more than 100% between 2010 and 2050 if the Final Plan scenario with the recommended regional transit system is implemented.

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Existing and Programmed Projects and New/Planned Collector Streets Scenario 1



- Capacity Reduction
- New/Programmed/Planned Collector Street
- Existing or Programmed Capacity Expansion

Prepared by staff to the:
Madison Area T·P·B Transportation Planning Board
Metropolitan Planning Organization (MPO)

Source Info:
Level of Service: 2016 (MATPB).
Street Base: 2016 (MATPB, DCLIO).
Hydrography: 12/00, 1:24,000 (WDNR).
Civil Division Limits: 2016, Annexation Records (DCLIO).

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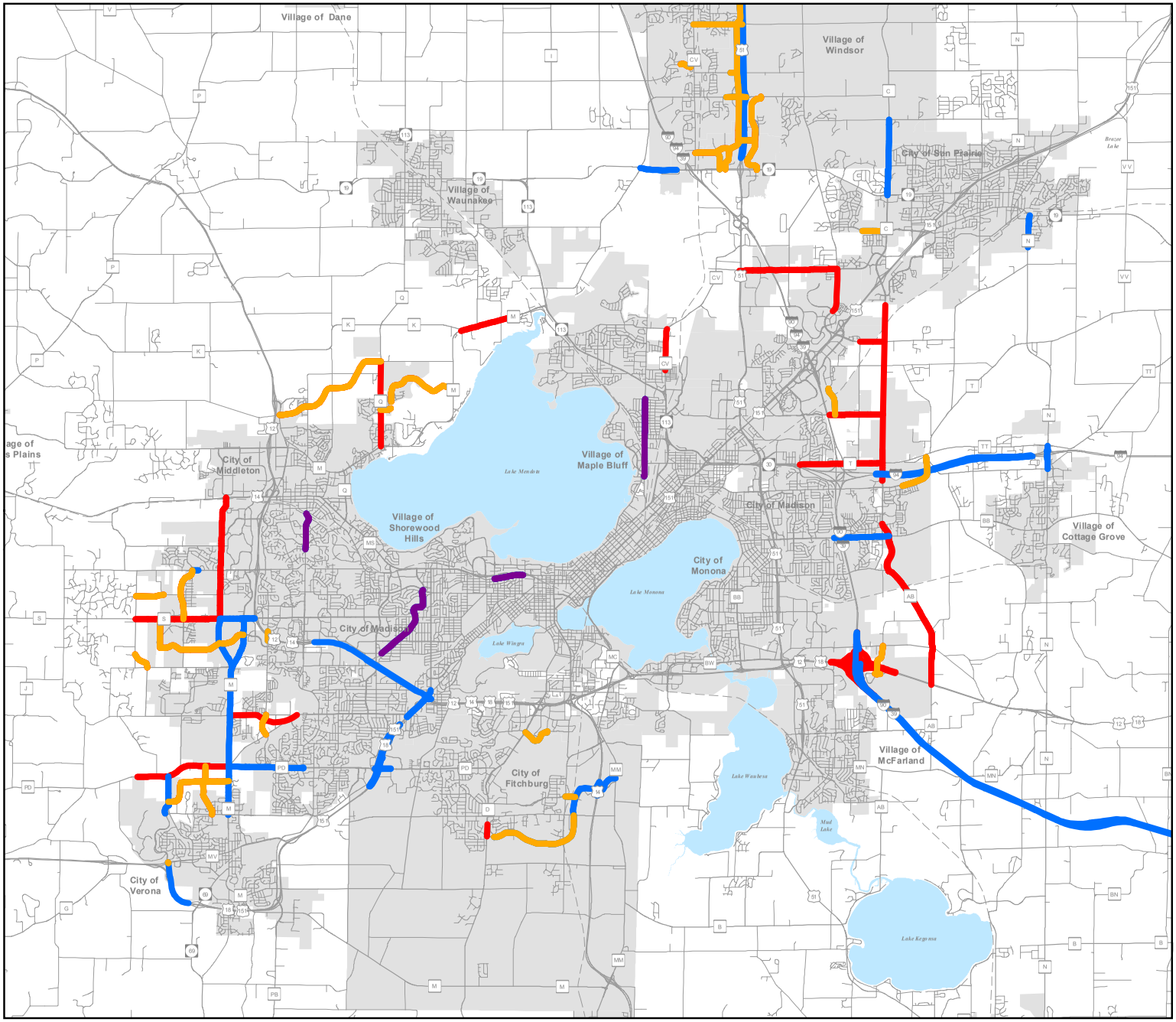
0 0.75 1.5
Miles

Date Revised: 3/31/2017

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Potential Capacity Expansion Projects Scenario 2 (Final Alternative)



Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board
Metropolitan Planning Organization (MPO)

Source Info:
Level of Service: 2016 (MATPB).
Street Base: 2016 (MATPB, DCLIO).
Hydrography: 1200, 124,000 (WDNR).
Civil Division Limits 2016, Annexation Records (DCLIO).

0 0.75 1.5
Miles

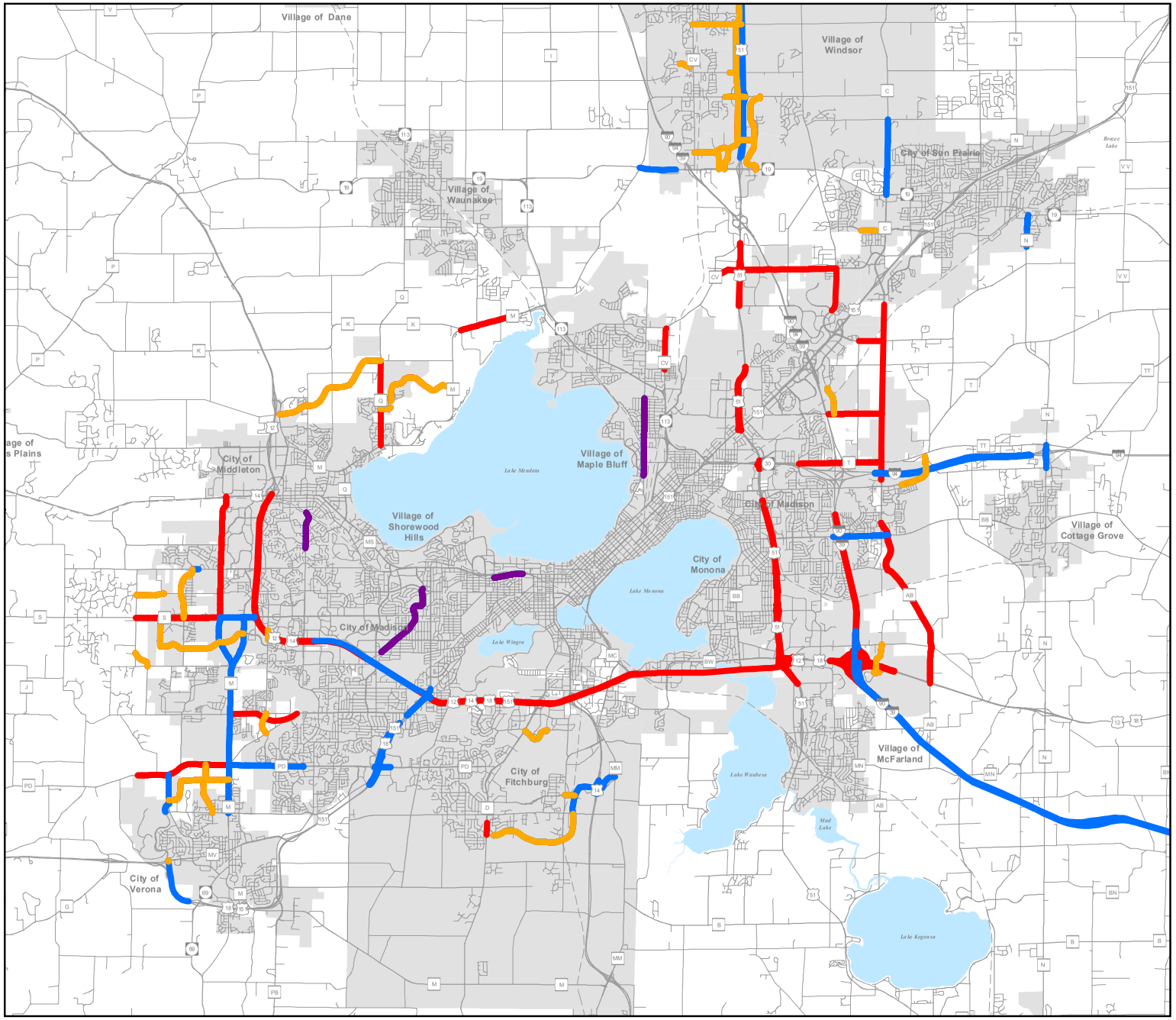
Date Revised: 3/31/2017

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Lambert Conformal Conic Projection
WISCRS - Dane, NAD 83(91)

Regional Transportation Plan 2050
Madison Area
Charting Our Course

Potential Capacity Expansion Projects Scenario 3 (Final Alternative with WisDOT Projects)



- Capacity Reduction
- New/Programmed/Planned Collector Street
- Existing or Programmed Capacity Expansion
- Potential Capacity Expansion

Prepared by staff to the:
Madison Area T•P•B Transportation Planning Board
A Metropolitan Planning Organization (MPO)

Source Info:
Level of Service: 2016 (MATPB.)
Street Base: 2016 (MATPB, DCLIO).
Hydrography: 1200, 124,000 (WDNR).
Civil Division Limits 2016, Annexation Records (DCLIO.)

0 0.75 1.5
Miles

Date Revised: 3/27/2017

Lambert Conformal ConicProjection
WISCRS- Dane, NAD 83(91)

Figure H-4

Weekday Vehicle Miles Traveled (VMT) by Functional Class

from the Dane County Travel Demand Model

Functional Classification	Base Scenario	Percent	Existing and Committed Scenario	Percent	Final Plan Scenario	Percent	Plan Scenario Plus DOT Projects	Percent
Urban/Rural Interstate	2,443,379	17.8%	4,416,750	22.3%	4,390,015	22.1%	4,422,251	22.1%
Urban/Rural Freeway	2,628,719	19.1%	3,608,829	18.2%	3,605,447	18.2%	3,804,345	19.0%
Urban/Rural Ramp	409,325	3.0%	615,523	3.1%	646,440	3.3%	680,554	3.4%
Urban/Rural Expressway	1,553,257	11.3%	2,215,321	11.2%	2,232,225	11.3%	2,207,702	11.0%
Urban Principal Arterial	1,898,826	13.8%	2,354,945	11.9%	2,358,496	11.9%	2,329,546	11.6%
Urban Minor Arterial	1,398,825	10.2%	1,780,257	9.0%	1,784,526	9.0%	1,791,163	8.9%
Urban Collector	670,653	4.9%	850,932	4.3%	837,949	4.2%	838,335	4.2%
Urban Local Roadway	36,248	0.3%	86,663	0.4%	67,374	0.3%	74,134	0.4%
Rural Principal Arterial	994,661	7.2%	1,257,079	6.3%	1,266,627	6.4%	1,265,930	6.3%
Rural Minor Arterial	857,068	6.2%	1,263,628	6.4%	1,257,094	6.3%	1,245,775	6.2%
Rural Major Collector	580,272	4.2%	920,641	4.6%	924,139	4.7%	911,677	4.6%
Rural Minor Collector	205,123	1.5%	309,859	1.6%	305,322	1.5%	301,966	1.5%
Rural Local Roadway	77,159	0.6%	163,850	0.8%	161,958	0.8%	159,960	0.8%
Grand Total	**13,753,515**	**100.0%**	**19,844,277**	**100.0%**	**19,837,611**	**100.0%**	**20,033,338**	**100.0%**

Figure H-5

Weekday Vehicle Hours Traveled (VHT) by Functional Class

from the Dane County Travel Demand Model

Functional Classification	Base Scenario	Percent	Existing and Committed Scenario	Percent	Final Plan Scenario	Percent	Plan Scenario Plus DOT Projects	Percent
Urban/Rural Interstate	36,499	12.0%	64,116	14.5%	63,621	14.5%	63,732	14.5%
Urban/Rural Freeway	45,447	15.0%	64,560	14.6%	64,272	14.6%	65,884	15.0%
Urban/Rural Ramp	11,142	3.7%	17,583	4.0%	17,725	4.0%	18,994	4.3%
Urban/Rural Expressway	30,350	10.0%	44,246	10.0%	44,377	10.1%	43,799	10.0%
Urban Principal Arterial	55,909	18.5%	74,772	16.9%	74,421	17.0%	72,969	16.6%
Urban Minor Arterial	42,563	14.0%	56,822	12.9%	56,437	12.9%	56,817	12.9%
Urban Collector	22,794	7.5%	30,563	6.9%	30,087	6.9%	30,071	6.8%
Urban Local Roadway	1,405	0.5%	3,432	0.8%	2,588	0.6%	2,782	0.6%
Rural Principal Arterial	20,097	6.6%	26,984	6.1%	26,888	6.1%	26,805	6.1%
Rural Minor Arterial	17,776	5.9%	27,393	6.2%	27,208	6.2%	26,927	6.1%
Rural Major Collector	12,494	4.1%	20,336	4.6%	20,424	4.7%	20,077	4.6%
Rural Minor Collector	4,545	1.5%	6,906	1.6%	6,801	1.5%	6,729	1.5%
Rural Local Roadway	1,959	0.6%	4,264	1.0%	4,212	1.0%	4,158	0.9%
Grand Total	**302,981**	**100.0%**	**441,976**	**100.0%**	**439,062**	**100.0%**	**439,743**	**100.0%**

Figure H-6

Weekday Average Vehicle Delay in Hours

from the Dane County Travel Demand Model

Functional Classification	Base Scenario	Percent	Existing and Committed Scenario	Percent	Final Plan Scenario	Percent	Plan Scenario Plus DOT Projects	Percent
Urban/Rural Interstate	41	0.3%	1,101	3.0%	1,014	3.0%	658	2.1%
Urban/Rural Freeway	2,138	13.6%	5,669	15.6%	5,450	15.9%	3,782	11.9%
Urban/Rural Ramp	649	4.1%	1,966	5.4%	1,665	4.9%	2,048	6.4%
Urban/Rural Expressway	865	5.5%	2,464	6.8%	2,404	7.0%	2,324	7.3%
Urban Principal Arterial	5,744	36.6%	11,520	31.6%	11,132	32.6%	10,422	32.8%
Urban Minor Arterial	4,126	26.3%	7,535	20.7%	7,056	20.6%	7,254	22.8%
Urban Collector	1,100	7.0%	2,305	6.3%	2,099	6.1%	2,106	6.6%
Urban Local Roadway	37	0.2%	314	0.9%	195	0.6%	202	0.6%
Rural Principal Arterial	394	2.5%	1,382	3.8%	1,129	3.3%	1,073	3.4%
Rural Minor Arterial	437	2.8%	1,426	3.9%	1,317	3.9%	1,268	4.0%
Rural Major Collector	155	1.0%	607	1.7%	604	1.8%	566	1.8%
Rural Minor Collector	10	0.1%	48	0.1%	45	0.1%	44	0.1%
Rural Local Roadway	16	0.1%	71	0.2%	72	0.2%	70	0.2%
Grand Total	**15,712**	**100.0%**	**36,411**	**100.0%**	**34,182**	**100.0%**	**31,817**	**100.0%**

Figure H-7

Weekday Vehicle Miles Traveled (VMT) by Functional Class

from the Dane County Travel Demand Model

Functional Classification	Percent Growth from Base Scenario to Existing and Committed Scenario	Percent Growth from Base Scenario to Final Alternative Scenario	Percent Growth from Base Scenario to Final Alternative Scenario w/ DOT Projects
Urban/Rural Interstate	80.8%	79.7%	81.0%
Urban/Rural Freeway	37.3%	37.2%	44.7%
Urban/Rural Ramp	50.4%	57.9%	66.3%
Urban/Rural Expressway	42.6%	43.7%	42.1%
Urban Principal Arterial	24.0%	24.2%	22.7%
Urban Minor Arterial	27.3%	27.6%	28.0%
Urban Collector	26.9%	24.9%	25.0%
Urban Local Roadway	139.1%	85.9%	104.5%
Rural Principal Arterial	26.4%	27.3%	27.3%
Rural Minor Arterial	47.4%	46.7%	45.4%
Rural Major Collector	58.7%	59.3%	57.1%
Rural Minor Collector	51.1%	48.8%	47.2%
Rural Local Roadway	112.4%	109.9%	107.3%
Grand Total	**44.3%**	**44.2%**	**45.7%**

Figure H-8

Weekday Vehicle Hours Traveled (VHT) by Functional Class
from the Dane County Travel Demand Model

Functional Classification	Percent Growth from Base Scenario to Existing and Committed Scenario	Percent Growth from Base Scenario to Final Alternative Scenario	Percent Growth from Base Scenario to Final Alternative Scenario w/ DOT Projects
Urban/Rural Interstate	75.7%	74.3%	74.6%
Urban/Rural Freeway	42.1%	41.4%	45.0%
Urban/Rural Ramp	57.8%	59.1%	70.5%
Urban/Rural Expressway	45.8%	46.2%	44.3%
Urban Principal Arterial	33.7%	33.1%	30.5%
Urban Minor Arterial	33.5%	32.6%	33.5%
Urban Collector	34.1%	32.0%	31.9%
Urban Local Roadway	144.3%	84.2%	98.0%
Rural Principal Arterial	34.3%	33.8%	33.4%
Rural Minor Arterial	54.1%	53.1%	51.5%
Rural Major Collector	62.8%	63.5%	60.7%
Rural Minor Collector	51.9%	49.6%	48.0%
Rural Local Roadway	117.6%	114.9%	112.2%
Grand Total	**45.9%**	**44.9%**	**45.1%**

Figure H-9

Weekday Average Vehicle Delay in Hours
from the Dane County Travel Demand Model

Functional Classification	Percent Growth from Base Scenario to Existing and Committed Scenario	Percent Growth from Base Scenario to Final Alternative Scenario	Percent Growth from Base Scenario to Final Alternative Scenario w/ DOT Projects
Urban/Rural Interstate	2606.9%	2392.2%	1516.8%
Urban/Rural Freeway	165.2%	154.9%	76.9%
Urban/Rural Ramp	203.2%	156.8%	215.8%
Urban/Rural Expressway	184.8%	177.8%	168.6%
Urban Principal Arterial	100.6%	93.8%	81.5%
Urban Minor Arterial	82.6%	71.0%	75.8%
Urban Collector	109.6%	90.9%	91.5%
Urban Local Roadway	746.8%	426.3%	445.7%
Rural Principal Arterial	250.7%	186.5%	172.3%
Rural Minor Arterial	226.6%	201.5%	190.3%
Rural Major Collector	291.2%	289.0%	264.9%
Rural Minor Collector	372.3%	337.4%	326.4%
Rural Local Roadway	338.6%	348.0%	332.7%
Grand Total	**131.7%**	**117.6%**	**102.5%**

Figure H-10

Total Transit Boardings - Base Scenario
from the Dane County Travel Demand Model

Service Type	AM	MD	PM	Total
Standard	13,121	12,772	15,163	41,056

Figure H-11

Total Transit Boardings - Existing and Committed Scenario
from the Dane County Travel Demand Model

Service Type	AM	MD	PM	Total
Standard	15,782	24,621	24,240	64,643
Express	443	0	608	1,051
Total	**16,225**	**24,621**	**24,848**	**65,694**

Figure H-12

Total Transit Boardings - Final Plan Scenario
from the Dane County Travel Demand Model

Service Type	AM	MD	PM	Total
BRT	5,840	12,004	8,484	26,328
Express	3340	0	5292	8632
Standard	13,594	25,864	21,077	60,535
Total	**22,774**	**37,868**	**34,853**	**95,495**

Figure H-13

Total Transit Boardings - Final Plan Scenario Plus WisDOT Projects
from the Dane County Travel Demand Model

Service Type	AM	MD	PM	Total
BRT	5,845	12,014	8,510	26,369
Express	3347	0	5299	8646
Standard	13,596	25,820	21,076	60,492
Total	**22,788**	**37,834**	**34,885**	**95,507**

Figure H-14

Base Year Scenario Transit Stats
from the Dane County Travel Demand Model

Model	AM	MD	PM	Total
Trips	11,796	11,768	13,626	37,190
Boardings	13,121	12,772	15,163	41,056
Transfer Rate	1.11	1.09	1.11	1.10

Figure H-15

Existing and Committed Scenario Transit Stats
from the Dane County Travel Demand Model

Service Type	AM	MD	PM	Total
Trips	13,770	21,281	20,594	55,645
Boardings	6,226	24,621	24,848	65,695
Transfer Rate	1.18	1.16	1.21	1.18

Figure H-16

Final Alternative Scenario Transit Stats
from the Dane County Travel Demand Model

Service Type	AM	MD	PM	Total
Trips	18,675	31,319	28,483	78,477
Boardings	22,774	37,868	34,853	95,494
Transfer Rate	1.22	1.21	1.22	1.22

Figure H-17

Final Alternative Scenario Plus WisDOT Projects - Transit Stats
from the Dane County Travel Demand Model

Service Type	AM	MD	PM	Total
Trips	18,668	31,264	28,476	78,408
Boardings	22,787	37,834	34,885	95,506
Transfer Rate	1.22	1.21	1.23	1.22

Note: Model is likely over-estimating the express route trips. Attempts to make input changes to remedy this were unsuccessful. A more realistic ridership total is in the 4,000 range based on service levels.



Madison Area Transportation Planning Board

PERFORMANCE MEASURES REPORT

Madison Area
T • P • B
Transportation Planning Board
A Metropolitan Planning Organization

Published July 2016

Madison Area Transportation Planning Board

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The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation. Information in this report is subject to change based on the final disposition of the federal transportation reauthorization bill Fixing America's Surface Transportation Act or FAST ACT.

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Regional Transportation Plan Goals and Measures

Goal: Create Connected Livable Neighborhoods and Communities

- *Miles of Pedestrian Facilities*
- *Miles of Bike Facilities*
- *BCycle Utilization*
- *Active Living Index*

Goal: Improve Public Health, Safety, and Security

- *Number and Rate of Motor Vehicle Crash Fatalities and Serious Injuries*
- *Number of Non-Motorized Fatalities and Serious Injuries*
- *County-wide Rolling Averages*

Goal: Support Personal Prosperity and Enhance the Regional Economy

- *Airline Passenger Traffic*
- *Freight Exports and Imports*
- *Housing + Transportation Costs*
- *Transit Access to Jobs*

Goal: Improve Equity for Users of the Transportation System

- *Transit Ridership*
- *Specialized Transit Ridership*
- *Fixed Route Transit Service Area*
- *Transit Coverage for Minorities and Low Income Persons*

Goal: Reduce the Environmental Impact of the Transportation System

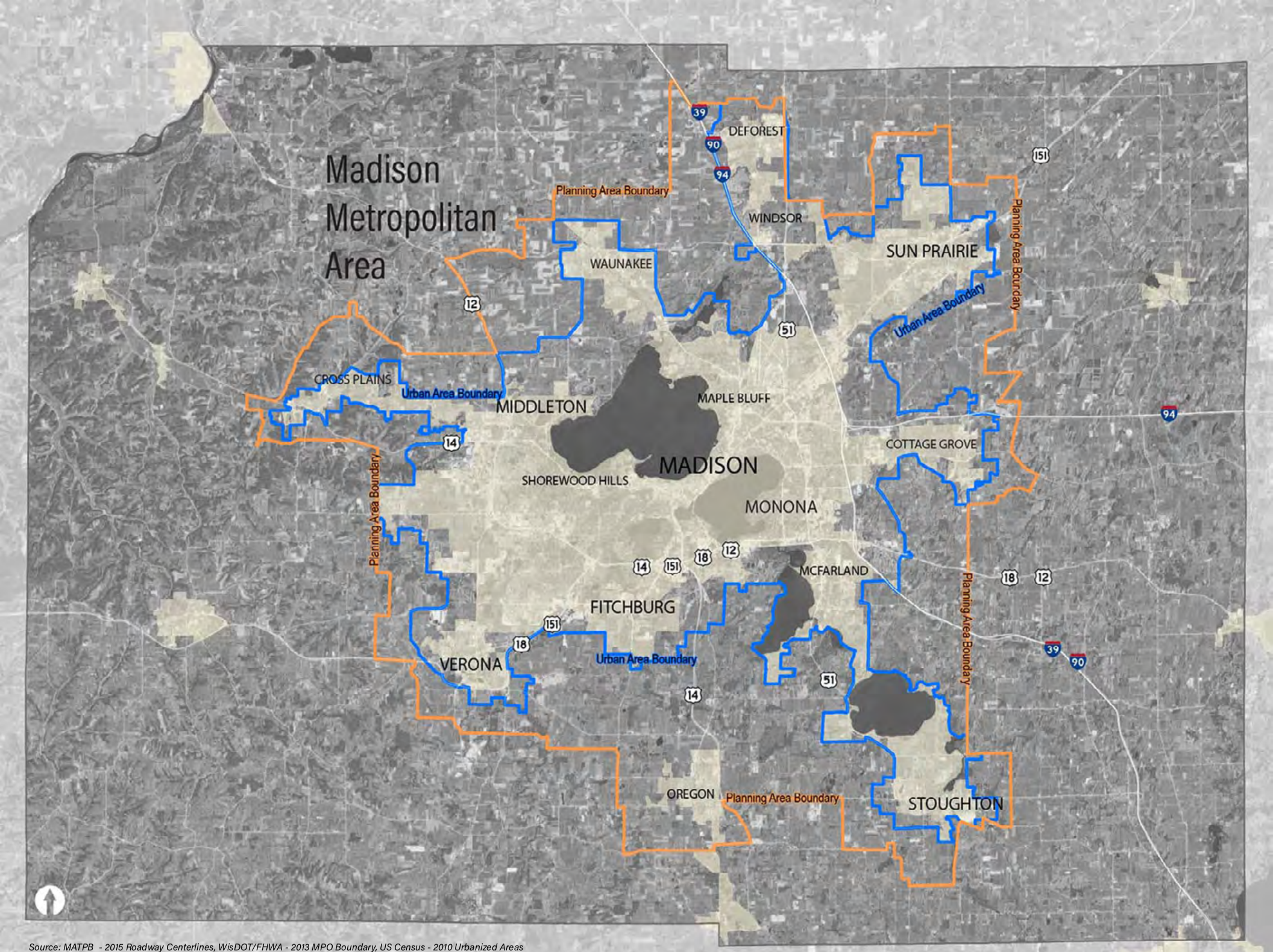
- *Vehicle Miles Traveled*
- *Mode of Transportation to Work*
- *Air Quality*

Goal: Advance System-wide Efficiency, Reliability, and Integration Across Modes

- *Transit On-time Performance*
- *Percent of Key Destinations Served by Transit*
- *Roadway Congestion*
- *Roadway Reliability*

Goal: Establish Financial Viability of the Transportation System

- *Bridge Condition*
- *Roadway Pavement Condition*
- *Buses at or Past Replacement Age*



Source: MATPB - 2015 Roadway Centerlines, WisDOT/FHWA - 2013 MPO Boundary, US Census - 2010 Urbanized Areas

Introduction

Purpose

The Madison Area Transportation Planning Board (MATPB), the Metropolitan Planning Organization (MPO) for the Madison area, creates and maintains the Regional Transportation Plan (RTP) for the Madison Metropolitan Area. The RTP, which is updated every five years, articulates the long-range transportation vision for the region. The RTP guides transportation investments and strategies to meet identified goals, integrating plans for the different transportation modes. Seven goals have been identified that describe outcomes the region will always work toward achieving. The goals and associated policies serve as a guide for infrastructure and service investment decisions and transportation policy for the region.

A series of performance measures have been developed to gauge progress in achieving the goals and help inform decisions about investments and strategies. This report provides data indicating how well the goals are being met. The report, which will be published annually, will describe how well the regional transportation system is performing over time.

The performance measures selected are not intended to be exhaustive. Rather, the list includes key measures that allow annual tracking of meaningful progress towards achieving plan goals and for which accurate, easily obtainable data is available. Some measures are applicable to more than one goal, but have been organized under the goal that fits best. Some aspects of the plan goals are not addressed by the measures due to unavailable, incomplete, or inaccurate data. It is anticipated that the list of performance measures will evolve over time as new data and measurement techniques become available. The performance measures report is intended to provide a system level overview of how the region is doing in achieving plan goals.

Report Findings

This is the first year that the Performance Measures Report has been published. Only baseline year data is available for many measures. However, data has been collected over an extended period of time for some measures. This provides information on changes in performance over time. The following are some notable trends for these measures:

Positive Trends

- *Rise in BCycle utilization as measured by number of trips (+60%), miles bicycled (+225%), and average trip length (+103%) between the first full-year of operation in 2012 and 2015*
- *Decline in vehicular crashes resulting in fatalities (-15%) and serious injuries (-25%) between 2006 and 2014*
- *Decline in bicycle and pedestrian crashes resulting in fatalities or serious injuries (-20%) over the same period*
- *Increase in airline passenger traffic between 2010 and 2014 (+10%)*
- *Increase in freight imports (+50%) and exports (+22%) between 2007 and 2013*
- *Good overall Metro Transit on-time performance (~7% arriving late), with the percentage of buses arriving late fluctuating between 2010 and 2015, but showing steady improvement from 2013 to 2015*
- *Vehicle miles traveled holding steady between 2007 and 2014*
- *Bridge and regional roadway pavement condition good overall and holding steady*

Negative Trends

- *Overall decrease in transit ridership between 2011 and 2015 (-3%) following increasing trend dating back more than 20 years*
- *Increase in the number of buses (+17) at or past replacement age between 2011 and 2015 (+86%)*



Create Connected Livable Neighborhoods and Communities

Create interconnected livable places linked to jobs, services, schools, shops, and parks through a multi-modal transportation system that is integrated with the built environment and supports compact development patterns that increase the viability of walking, bicycling, and transit.

Create Connected Livable Neighborhoods and Communities

Miles of Pedestrian Facilities

Pedestrian facilities, such as sidewalks, crosswalks, and off-street paths, are an integral component of the transportation network. Pedestrian walkways provide persons with access to the rest of the transportation network and the transit system. They also provide independent mobility for short trips. In fact, walking is the second most common mode of transportation. A fully-developed pedestrian network ensures that neighborhoods are connected and that people are able to safely and efficiently reach their destinations.

2015 was the first year that comprehensive data on pedestrian facilities has been collected for the region and serves as a baseline year. There are currently 1,339 miles of pedestrian facilities in the metro area, an increase of 26 miles in the last year.

DESIRED TREND

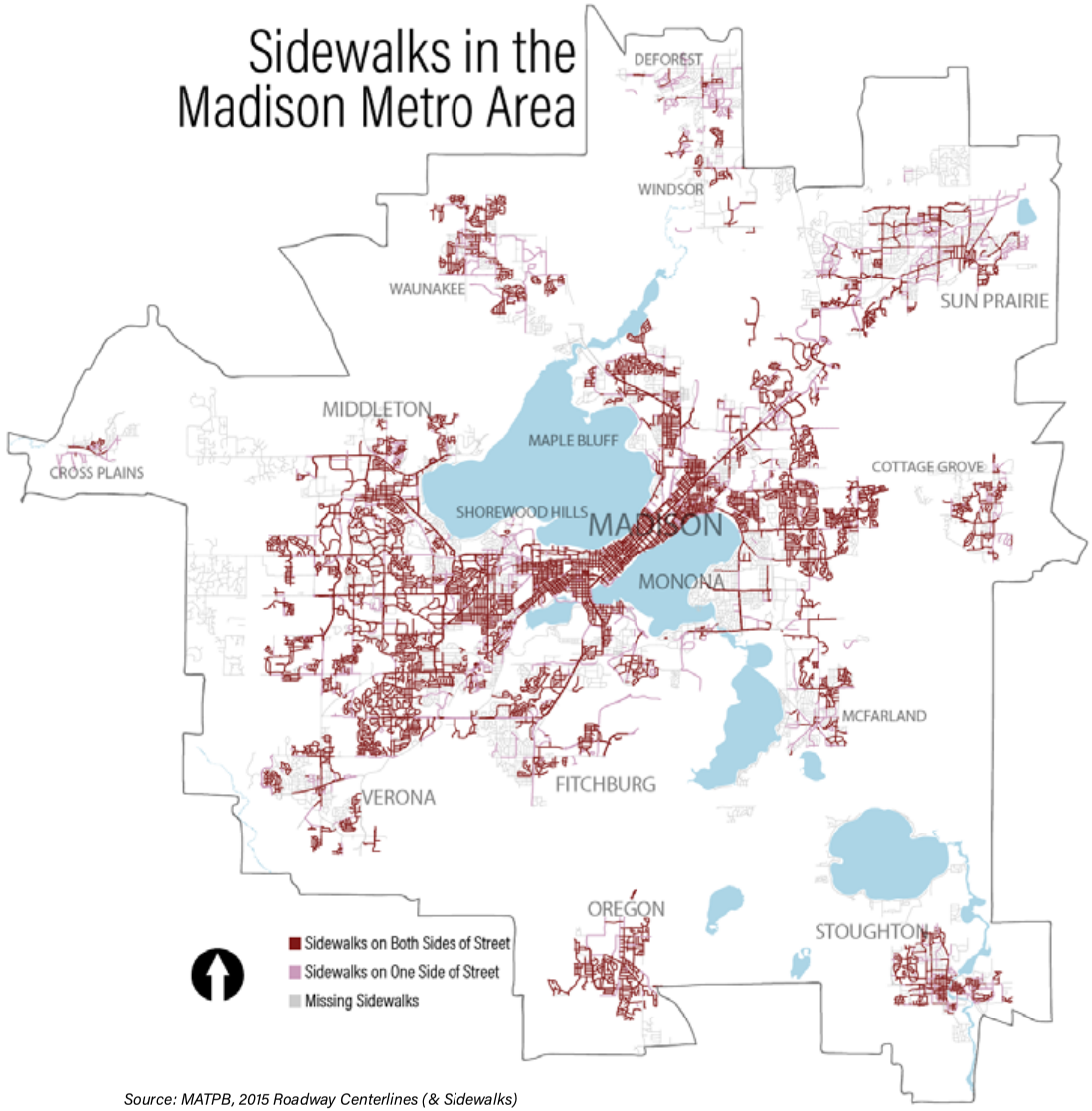


in miles of facilities

ACTUAL TREND



in miles of facilities



Source: MATPB, 2015 Roadway Centerlines (& Sidewalks)

Miles of Bicycle Facilities

Bicycling is an important mode of transportation and healthy recreational activity. It is efficient and convenient for trips up to 2-5 miles and is accessible to people of most ages and incomes. Bicycling facilities enhance quality of life and health, strengthen communities, increase safety, reduce congestion, and benefit the environment. Bicycle facilities come in many forms, including on-street facilities such as bike lanes (striped, buffered, protected) and bike boulevards as well as off-street facilities, such as shared-use paths and pedestrian/bicycle bridges and underpasses.

The metro area's commitment to cycling has led to the region being recognized as one of the most bicycle friendly in America. In 2015, the League of American Bicyclists upgraded the Bicycle Friendly Community status of the cities of Madison and Fitchburg to Platinum and Gold respectively, while awarding the cities of Middleton and Monona their first recognition as Bronze Bicycle Friendly Communities. In fact, Madison's status makes the city one of the top five most bicycle friendly communities in the country.

2015 will serve as a baseline year for the miles of bicycle facilities measure due to a methodology change in the measurement of the facilities. Over the next 5 years the region is expected to add a new bicycle station in downtown Madison, six new bicycle/pedestrian bridges or underpasses, and over 12 miles of new shared-use paths and trails.

DESIRED TREND



INCREASE
in miles of facilities

ACTUAL TREND



UNKNOWN

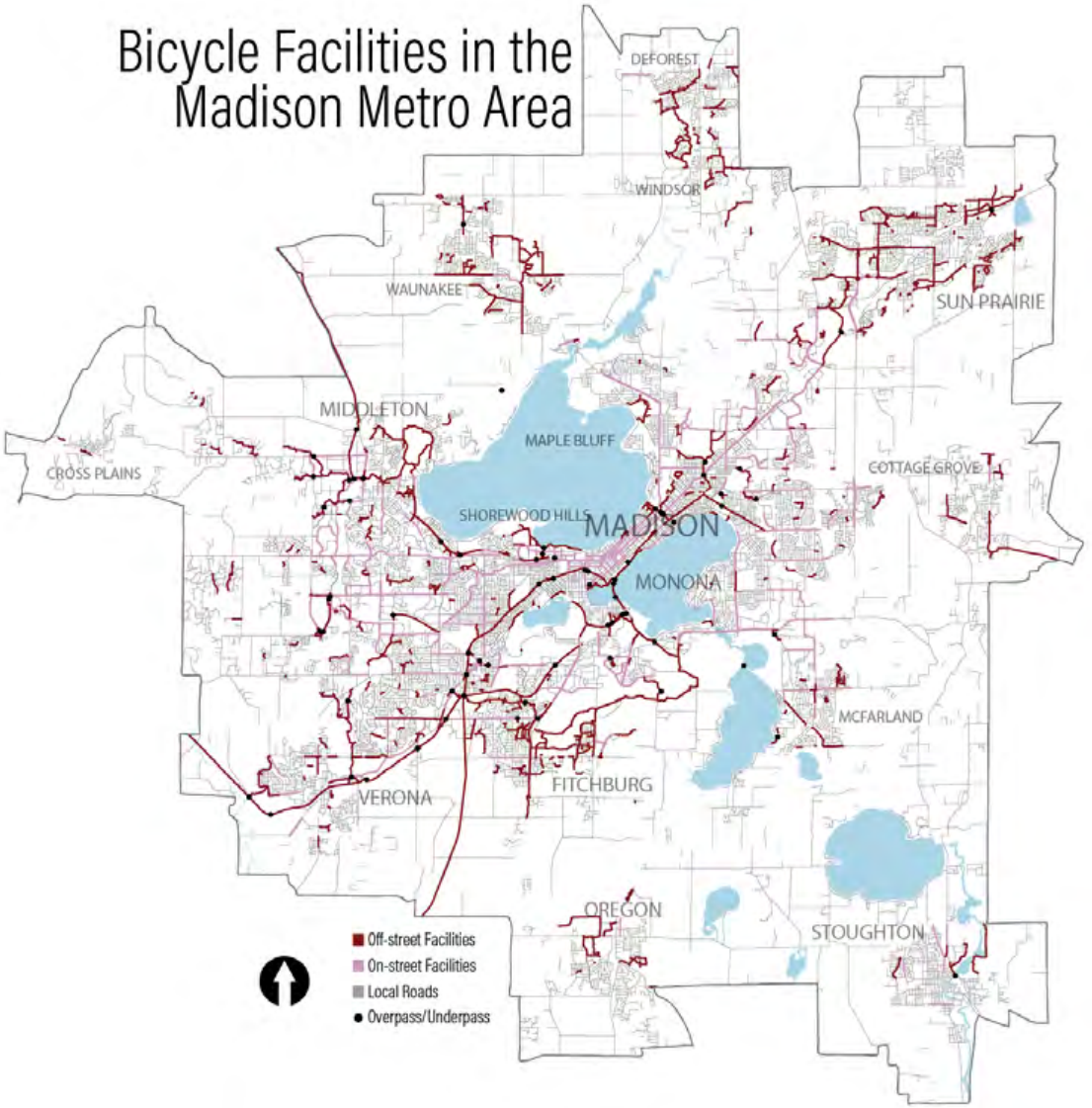
Bicycle Facilities in 2015

104 miles on-street in Madison

158 miles on-street in Metro Area

76 miles off-street in Madison

223 miles off-street in Metro Area



Source: MATPB - 2015 Roadway Centerlines (& On-street Bike Facilities), 2015 Bike Bridges, 2015 Off-Street Bike Facilities

BCycle Utilization

Bicycle sharing systems provide bicycles for shared use on a short-term basis, thus providing mobility at low-to no cost to ride. Locally, B-Cycle provides a bicycle sharing service that primarily serves the Isthmus area and the University of Wisconsin and Madison College campuses – areas with a well developed bicycle network and high housing and destination densities.

Since launching in 2011, B-Cycle utilization has grown tremendously. Annual trips using the service have increased nearly every year and membership has increased by 30% since its first full year of operation. B-Cycle has demonstrated a commitment to adding stations to the community, increasing the number of stations by 13 since its launch. In 2015, utilization numbers increased across the board, with the exception of total trips. Though total trips decreased the average trip length increased 44% from 2.1 to 3.0 miles last year.

DESIRED TREND



ACTUAL TREND



BCycle in the Madison Metro Area

Year	Trips	Members	Miles Biked	Avg Trip in Miles	Stations	Pop Served
2011*	18,501	475	39,618	2.14	27	39,664
2012	63,325	2,150	94,402	1.49	35	42,862
2013	81,662	1,843	173,940	2.13	35	42,862
2014	104,274	2,622	219,108	2.10	39	45,091
2015	101,339	2,789	307,241	3.03	40	45,465

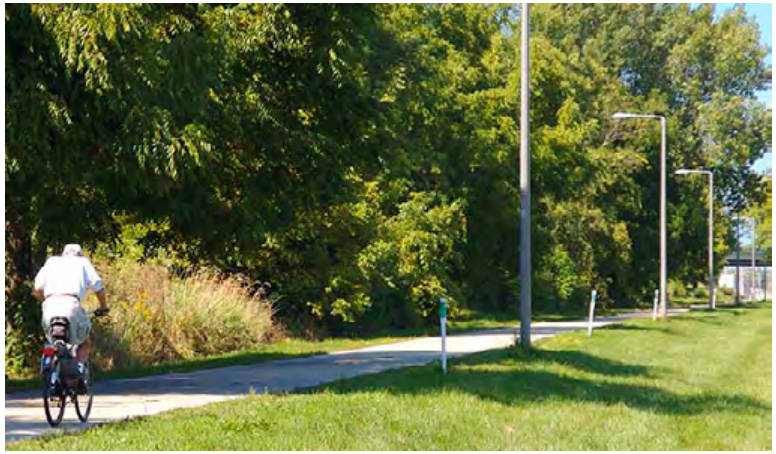
**Partial year of data. Service Launched in June 2011.*



Source: MATPB - 2015 Roadway Centerlines (& On-street Bike Facilities), 2015 Bike Bridges, 2015 Off-Street Bike Facilities; BCycle - 2015 Station Locations







Active Living Index

There is a strong connection between the configuration of the built environment and the health and overall well-being of residents. Environments that provide residents with the ability to live an active lifestyle have lower rates of chronic disease, obesity, depression, and mental health disorders. Tangentially, these environments lead to reduced emissions, increased safety, and a multitude of economic benefits.

To quantify the degree to which a neighborhood is conducive to active living, MATPB worked with the City of Madison and the Capital Area Regional Planning Commission to develop the Active Living Index. The Active Living Index measures the walkability of an area (based on intersection, population, and destination density), access to bicycle facilities, and access to transit and jobs via transit.

Active Living Index Rank by Score

Rank	Community	Score	Maximum	Minimum
1	**Shorewood Hills**	**27.1**	57.3	9.2
2	**Madison**	**20.2**	75.8	1.5
3	**Middleton**	**19.6**	53.0	2.6
4	**Maple Bluff**	**19.2**	47.0	7.2
5	**Fitchburg**	**19.2**	52.2	2.5
6	**Sun Prairie**	**18.8**	42.2	3.0
7	**Monona**	**18.7**	52.8	3.3
8	**Verona**	**17.0**	55.1	2.7
9	**Waunakee**	**16.3**	38.4	5.4
10	**Stoughton**	**15.8**	52.4	4.0
11	**McFarland**	**15.5**	47.0	3.7
12	**DeForest**	**14.5**	47.1	1.5
13	**Cottage Grove**	**14.2**	33.4	6.0
14	**Cross Plains**	**13.7**	39.9	4.3
15	**Oregon**	**13.4**	46.6	1.5

Active Living Index scores were calculated for the first time in 2015. Now that the scores have been calculated, communities will be able to quantify the benefit of transportation investments through a simple visual comparative analysis. More information about the Active Living Index can be found on the MATPB website.

DESIRED TREND

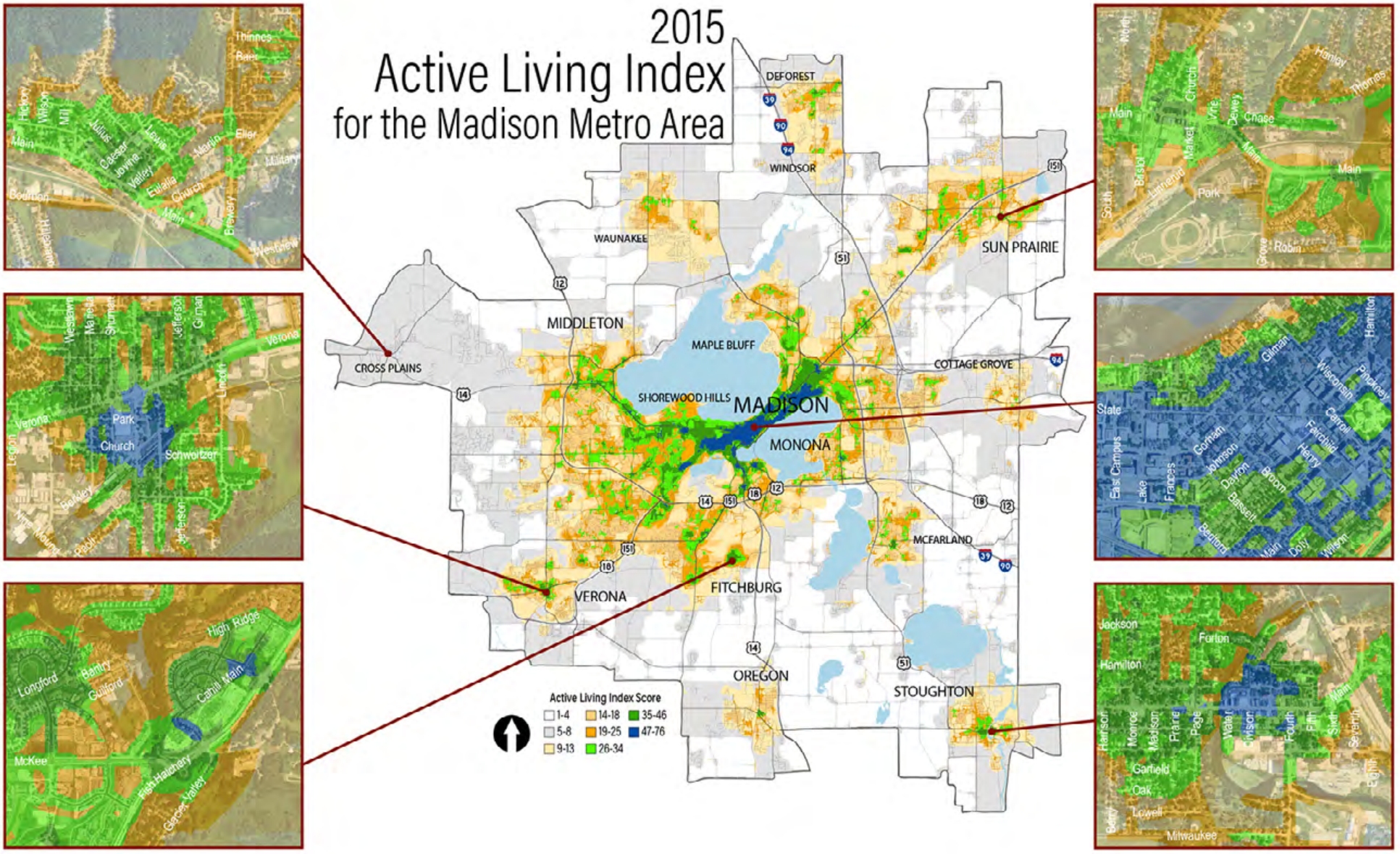


INCREASE
in community
scores

ACTUAL TREND



UNKNOWN



Source: MATPB - 2015 Roadway Centerlines, 2015 Active Living Index Scores (collaboration with CARPC, City of Madison)



Improve Public Health, Safety, and Security

Design, build, operate, and maintain a transportation system that enables people to get where they need to go safely and that, combined with supportive land use patterns and site design, facilitates and encourages active lifestyles while improving air quality.

Photo Credit: Madison Fire Department

Improve Public Health, Safety, and Security

Federal Requirements

Improving safety is a top priority and is at the heart of many transportation investment decisions. In early 2016, the Federal Highway Administration (FHWA) released rules establishing measurement of safety on the transportation network. The MATPB must now track these specific measures, and work with the Wisconsin Department of Transportation to set attainable future targets by 2017.

Motor Vehicle Crash Fatalities and Serious Injuries

Deaths as a result of motor vehicle collisions have remained relatively stable in the last five years, dropping from 33 to 28 in 2014. When normalized by estimated vehicle miles traveled (VMT), the same pattern is evident. Serious injuries are those that would result in surgery, hospitalization, or a lifestyle change. In Dane County, serious injuries declined by 25% between 2010 and 2014.

Pedestrian and Bicycle Fatalities and Serious Injuries

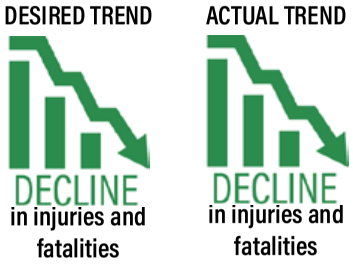
Pedestrian and bicyclist deaths and injuries have fallen in recent years, with a 46% decrease from 2010 to 2014.

County-wide Five-Year Rolling Averages

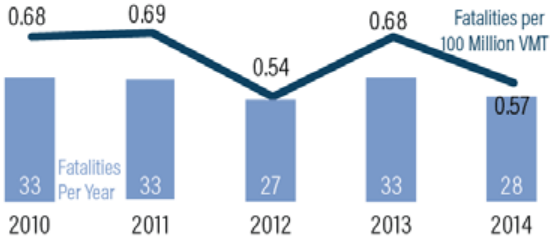
Rolling averages smooth out aberrations that may skew data between years. To develop the averages, counts and rates are added for a series of years and averaged for the time period. Rolling averages show that fatalities and injuries have dropped relatively constantly since the 2006-2010 period.

Five-Year Rolling Averages: Motorized and Nonmotorized Fatalities and Serious Injuries

	2006-2010	2007-2011	2008-2012	2009-2013	2010-2014
Vehicular Fatalities	36.2	34.4	31.2	31.6	30.8
Vehicular Fatality Rate	0.742	0.711	0.645	0.651	0.632
Vehicular Injuries	229.0	216.6	193.4	179.8	172.6
Vehicular Injury Rate	4.697	4.478	4.002	3.702	3.541
Nonmotorized Inj. and Fat.	46.4	45.8	44.0	41.4	37.0



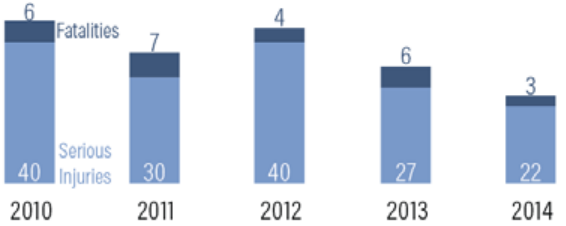
Dane County Motor Vehicle Fatalities & Rates

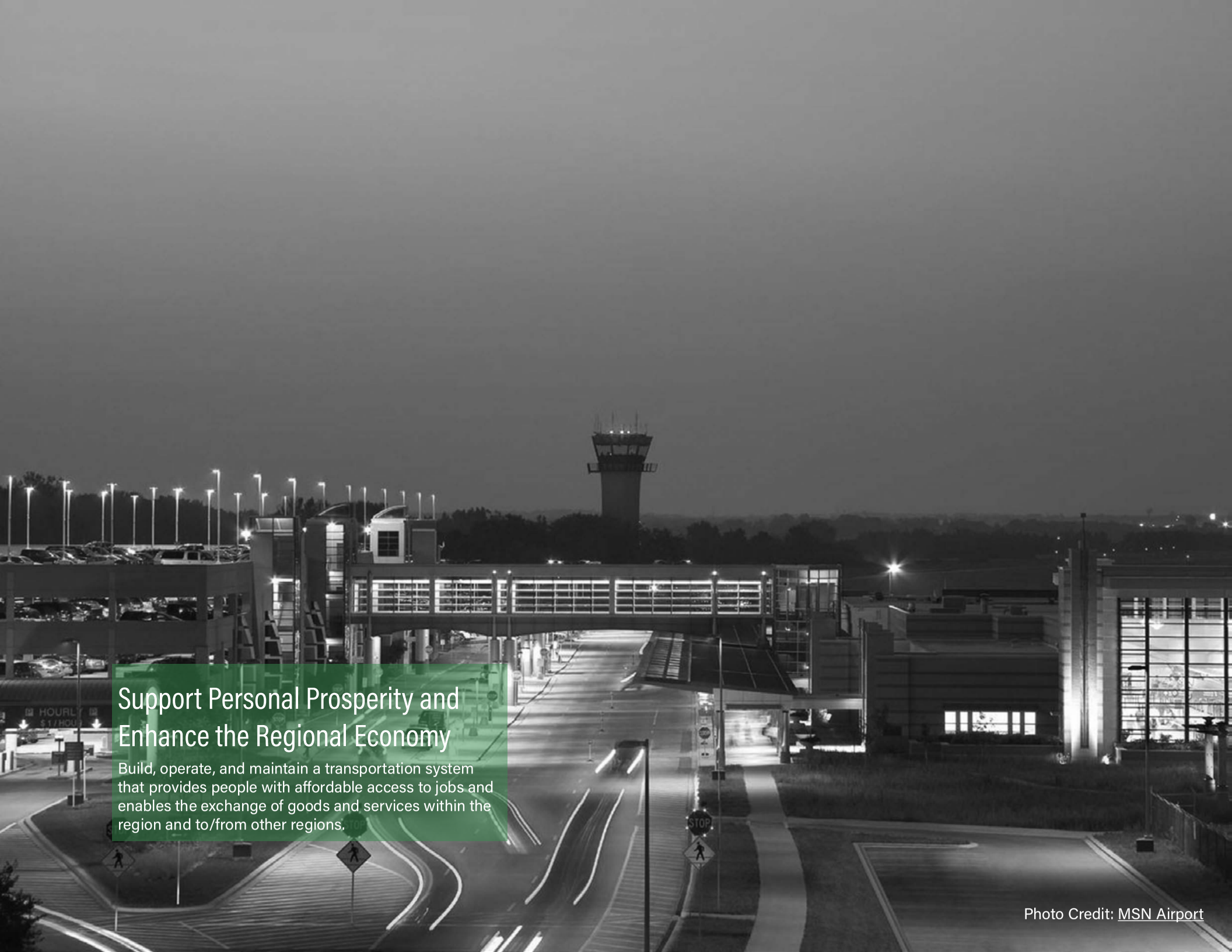


Dane County Motor Vehicle Serious Injuries and Rates



Dane County Pedestrian and Bicycle Fatalities and Serious Injuries





Support Personal Prosperity and Enhance the Regional Economy

Build, operate, and maintain a transportation system that provides people with affordable access to jobs and enables the exchange of goods and services within the region and to/from other regions.

Photo Credit: MSN Airport

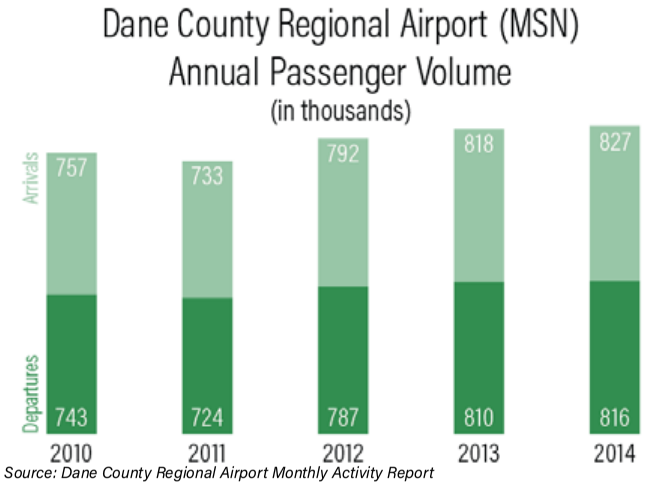
Support Personal Prosperity and Enhance the Regional Economy

Airline Passenger Traffic

Airline passenger traffic can be used to monitor business success as well as personal financial well-being. In fact, the area's largest private sector employer, Epic Systems, uses the airport for approximately 1,200 staff flights weekly.[1] Some flights are bound for the area as a tourist destination, injecting money directly into the local economy. Each flight requires a trip to and/or from the airport, meaning that the success of the airport is tied to the quality and reliability of the greater transportation network. During the Great Recession, departures and arrivals fell at Dane County Regional Airport. However, both arrivals and departures have increased each year since 2011.







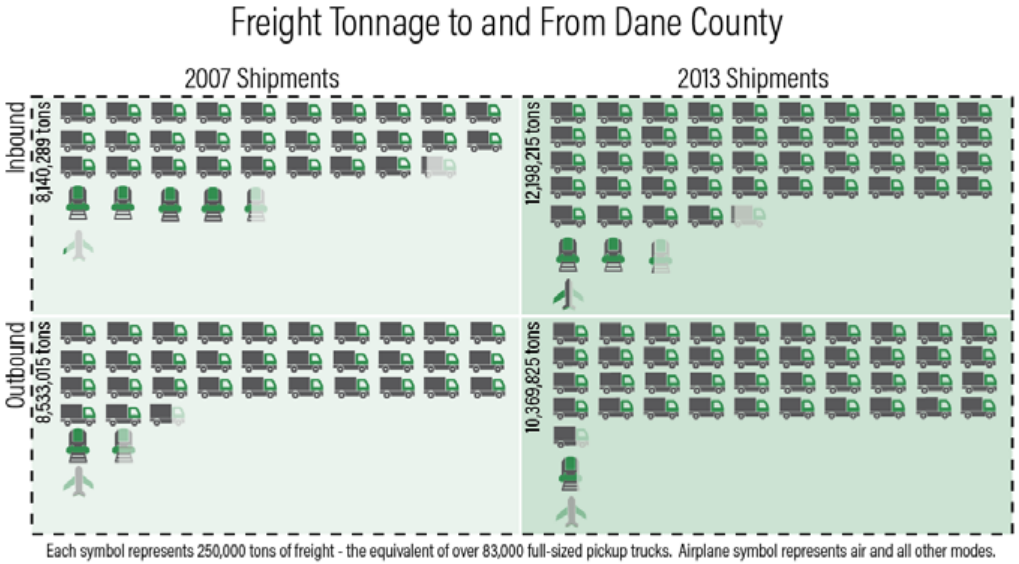
Source: Dane County Regional Airport Monthly Activity Report

Freight Imports and Exports

The rise of e-commerce has had a dramatic impact on the amount of freight being shipped to and from the region. At the same time, the rise of just-in-time manufacturing has placed increased pressure on maintaining a reliable transportation network. Freight tonnage originating in and bound for Dane County has surged in recent years. Interestingly, freight tonnage has increased only on roadways, with major declines in rail and air freight.

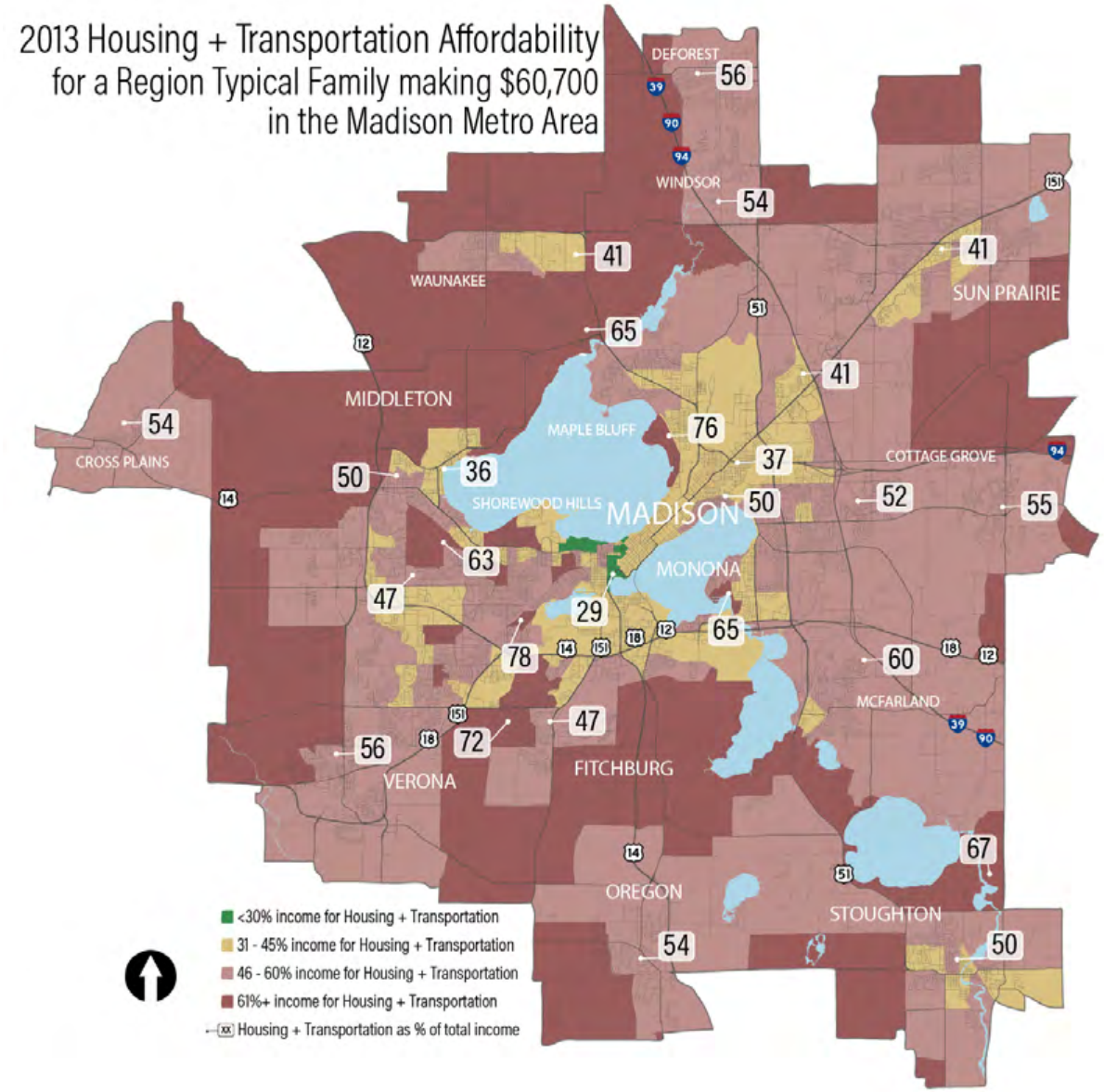






Source: 2013 IHS Transsearch, 2007 Global Insight Dane County commodity flow data

1. Ivey, Mike. "Epic Systems Driving $30 Million Parking Expansion at Airport." Madison.com. The Capital Times, 8 Oct. 2013.



Source: MATPB - 2015 Roadway Centerlines, Center For Neighborhood Technology - 2013 Housing, Transportation, & H+T Scores

Housing + Transportation Costs

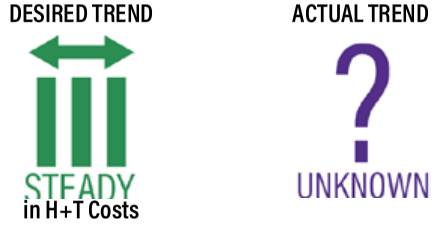
Traditionally, affordable housing has been defined as housing that costs no more than 30% of household income. However, this measure of housing affordability is not holistic as it fails to take into account the interrelatedness of housing to a household's second biggest expense, transportation. A typical household in Dane County has 2.35 people, has 1.22 workers, makes $60,694 per year, spends over $17,500 per year on housing, and spends nearly $13,000 per year on transportation costs, according to an analysis of US Census Bureau data by the Center for Neighborhood Technology (CNT).

The Housing + Transportation tool, created by the CNT, determines location affordability using neighborhood, household, and travel characteristics to estimate total household transportation cost. When adding transportation costs to the housing affordability formula, a 45% threshold for determining affordability is recommended.

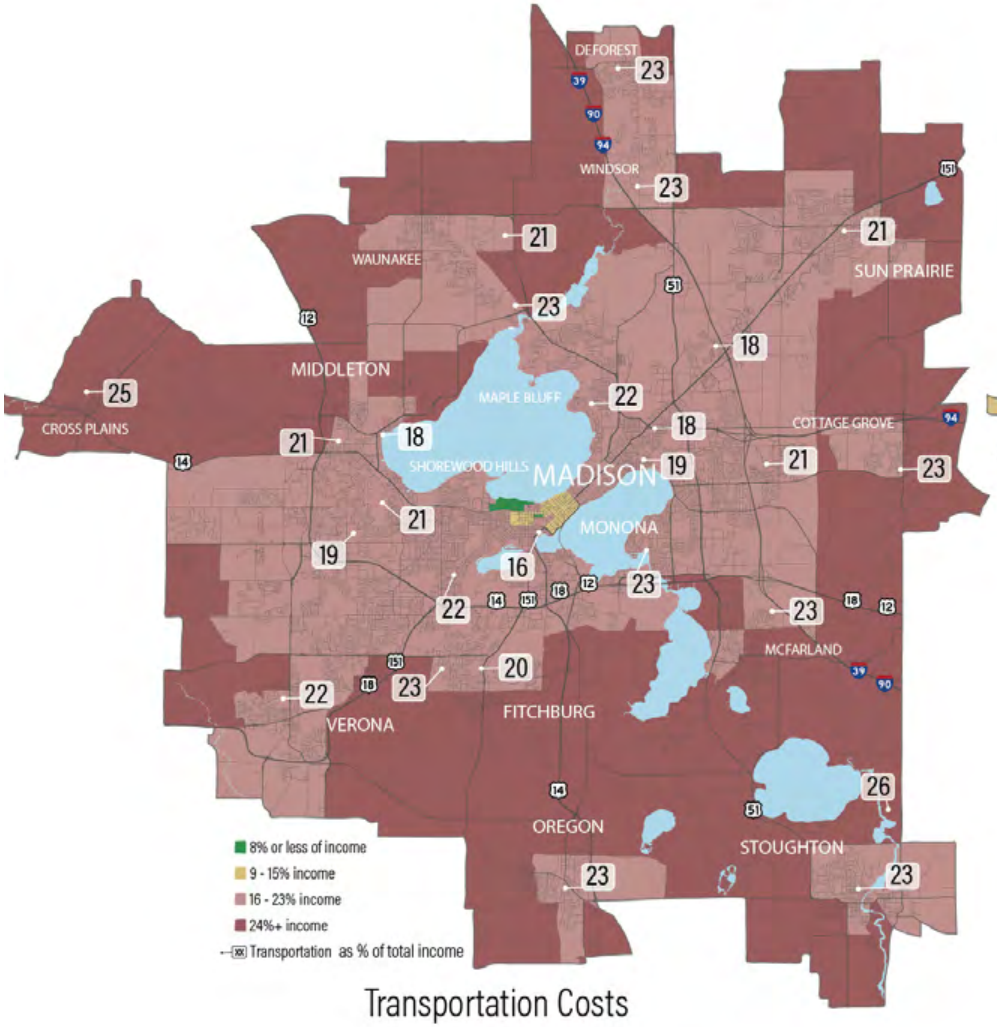
Applying the affordability threshold of 15% of a typical income household, transportation costs are not affordable to households with typical income in most parts of the metropolitan area (page 13). Only portions of the Isthmus are affordable, encompassing only 9% of the regional population. However, many areas, particularly those near transit corridors and bus transfer points, are near-affordable. As one would expect, rural areas and suburbs that are not part of the contiguous core urban area have higher transportation costs.

Housing costs deviate from transportation trends in that some of the most and least expensive housing is found within the core of the urban area (right). At the same time, relatively inexpensive housing can be found in suburban locations, such as Sun Prairie and Stoughton.

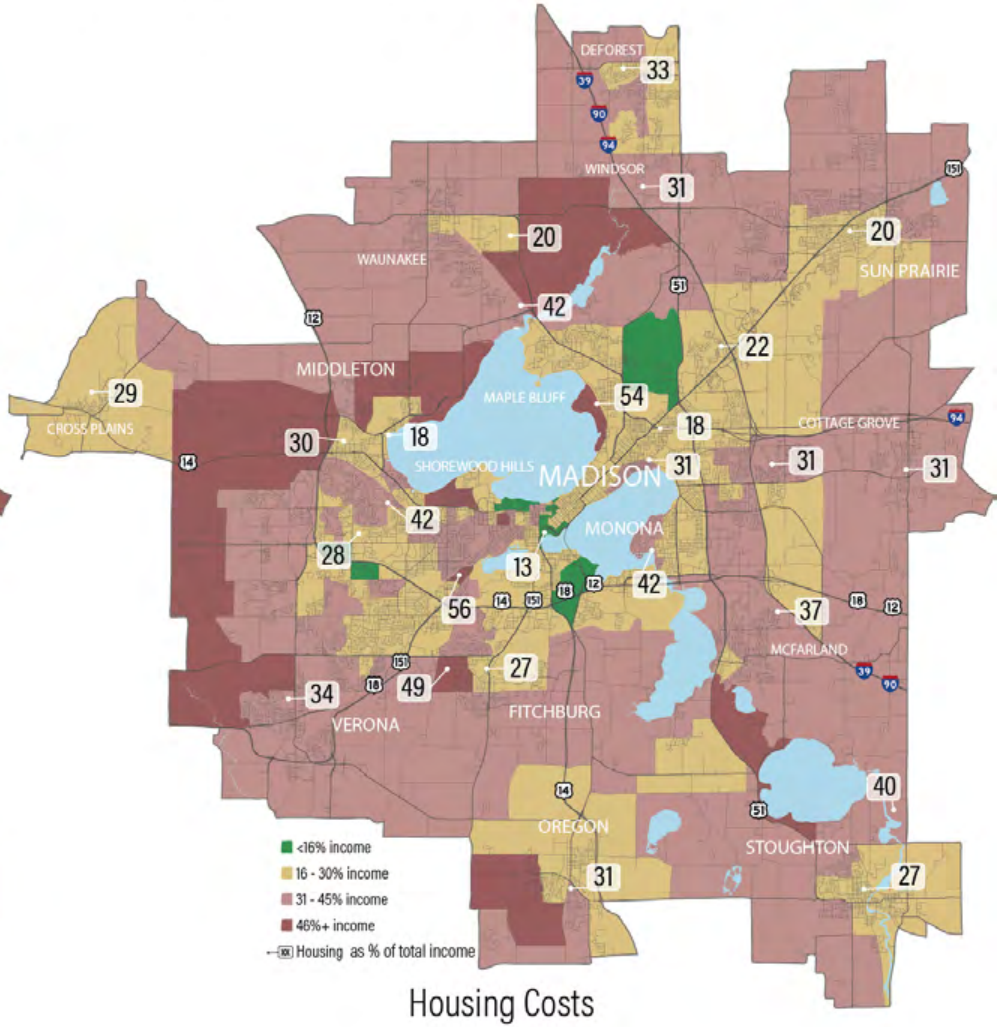
Looking at housing and transportation costs together, it is apparent that urban and dense suburban locations – mostly those with good transit service - are the most truly affordable locations for a typical household.



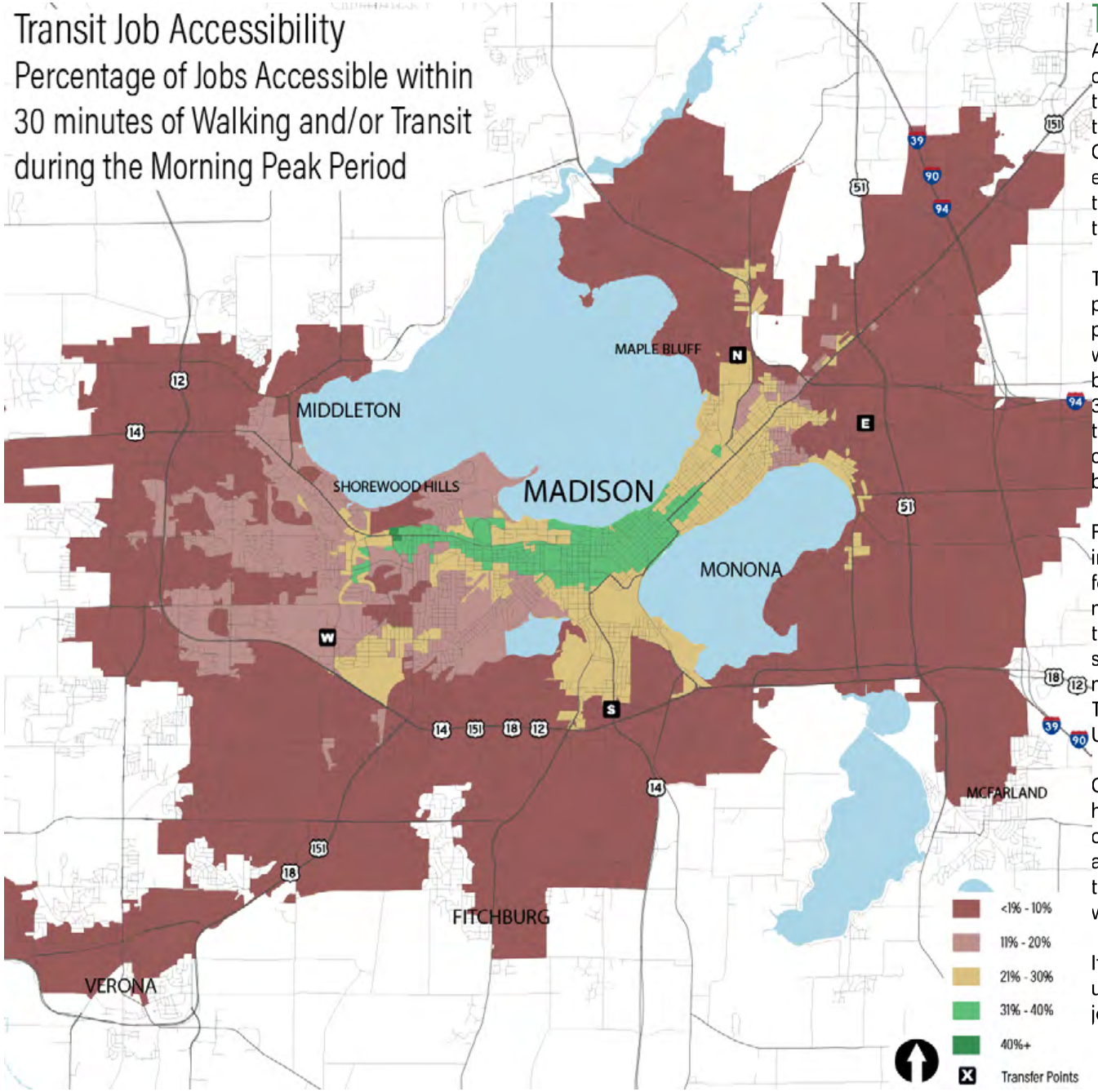
Regional Affordability for a Typical Dane County Family making $60,700



Transportation Costs



Housing Costs



Source: MATPB - 2015 Roadway Centerlines, Metro Transit - 2015 routes/stop locations, InfoUSA - 2010 employment locations. Areas in white are not served by transit.

Transit Access to Employment

According to US Census data, more than 6% of commuters in the Madison Urban Area use public transportation to get to work. Most bus service in the Madison area is provided by Metro Transit, a City of Madison-owned transit system with service extending into several other communities. Public transit gives people a low-cost, stress-free alternative to driving that conserves fuel and reduces emissions.

The Transit Job Accessibility map shows the percentage of jobs in the Madison Urban Area that a person residing within each Census Block can access within 30 minutes (page 14) and 45 minutes (page 15) by walking and/or using public transit. A commute of 30 minutes or less is desirable while many people in the Madison area would likely consider a 45-minute commute tolerable. Longer commutes can be made but are not competitive with driving or other modes.

Residents in central Madison can access more jobs in the region than people living around the periphery for several reasons. First, central Madison is in the middle of Metro Transit's service area, allowing them to travel in all directions to access jobs. Second, service levels are higher in central Madison with more frequent service and more routes available. Third, jobs are regionally concentrated around the University of Wisconsin campus and Capitol Square.

Commuters using transit in the Madison Urban Area have longer commutes on average than those using other modes while covering shorter distances. The average Madison area transit commuter is estimated to spend about 33 minutes getting to work, compared with about 20 minutes for other modes.

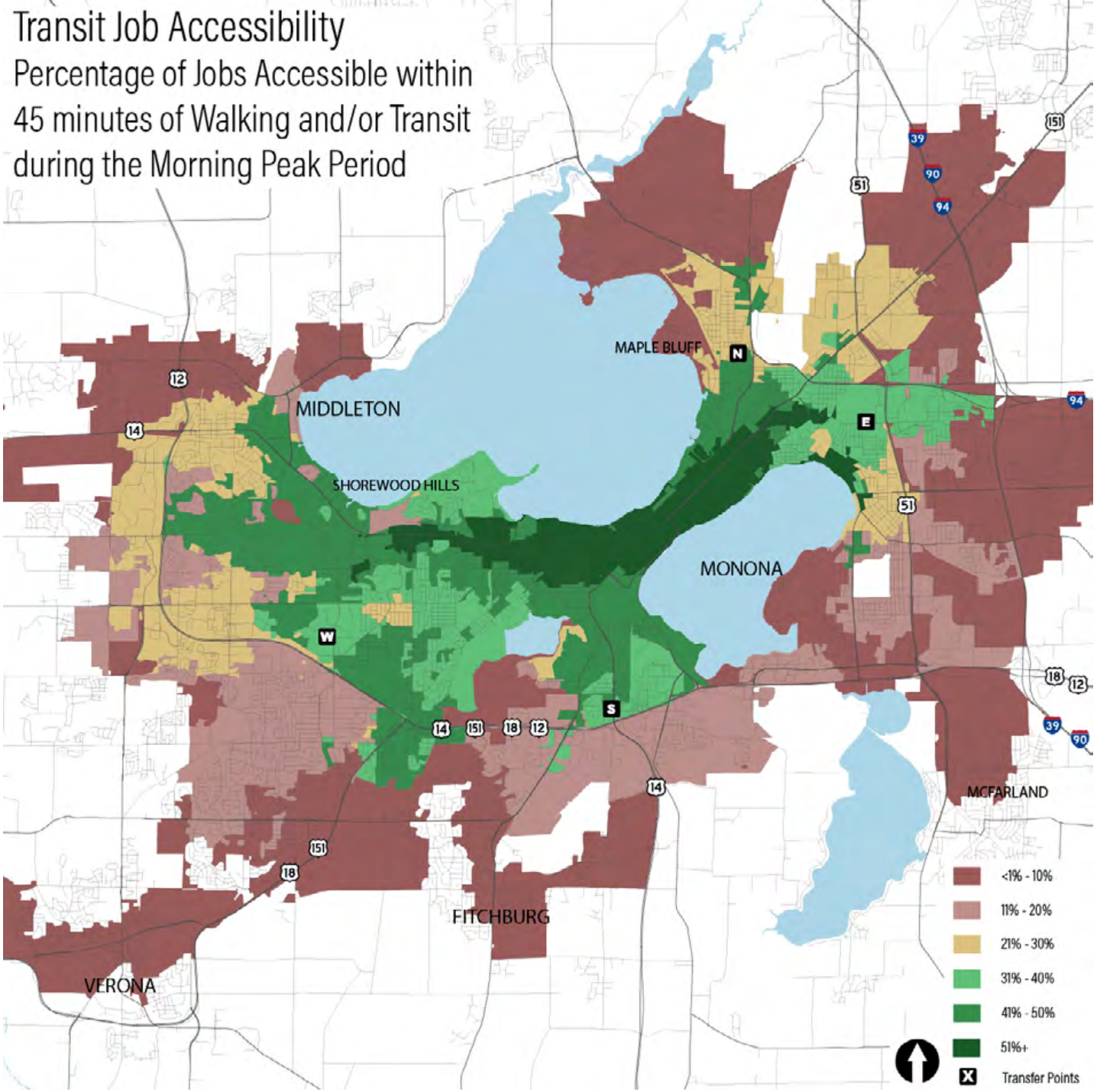
It is estimated that only 52,750 people or 12% of the urban area population can access 50% or more of the jobs within 45 minutes.

DESIRED TREND

INCREASE
in job accessibility

ACTUAL TREND

?
UNKNOWN



Source: MATPB - 2015 Roadway Centerlines, Metro Transit - 2015 routes/stop locations, InfoUSA - 2010 employment locations. Areas in white are not served by transit.



Improve Equity for Users of the Transportation System

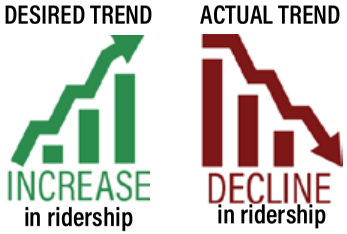
Provide an equitable level of transportation facilities and services for all regardless of age, ability, race, ethnicity, or income.

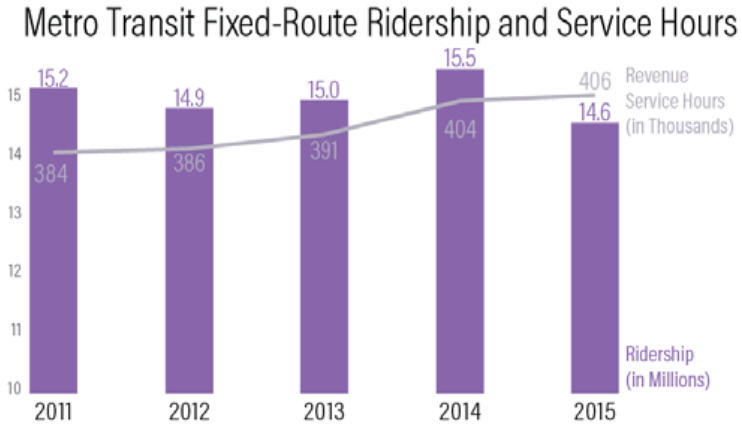
Improve Equity for Users the Transportation System

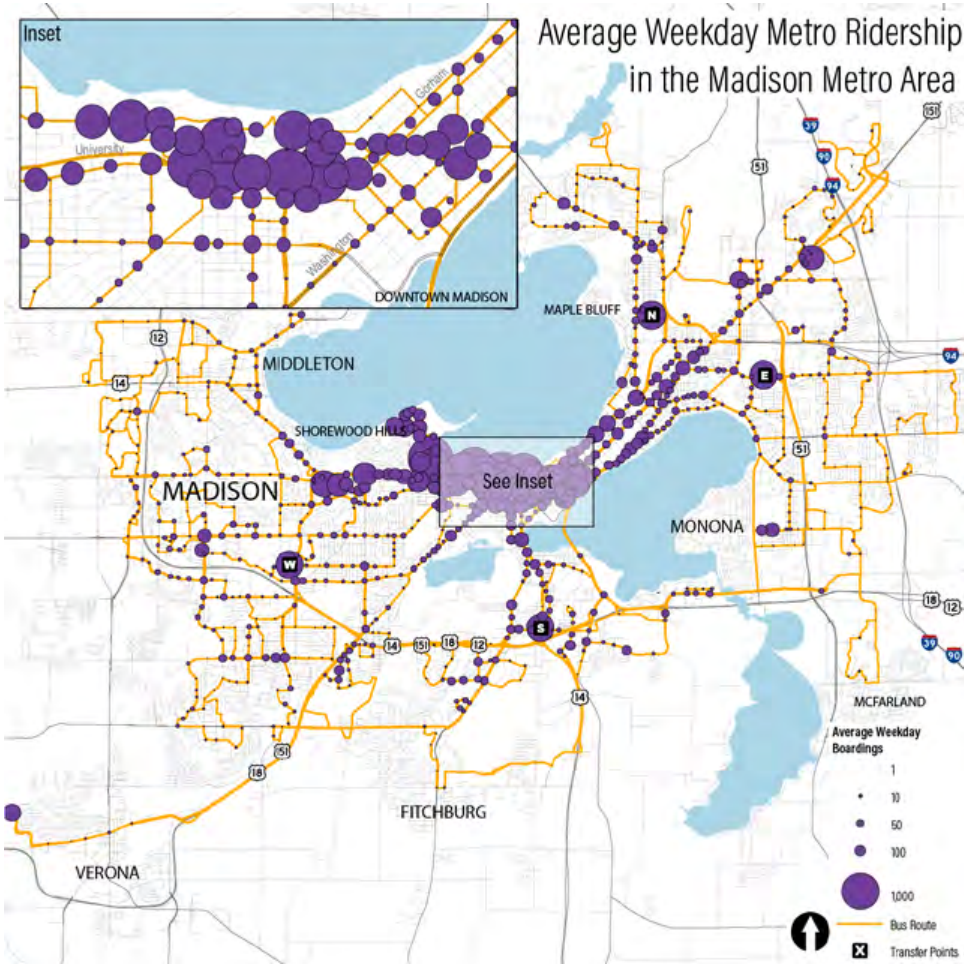
Transit Ridership

Efficient and well-used public transit service is a key component of a well-balanced transportation system that serves all users. Two transit systems operate fixed-route bus service – Madison Metro Transit and Monona Transit – in the Madison Urban Area.

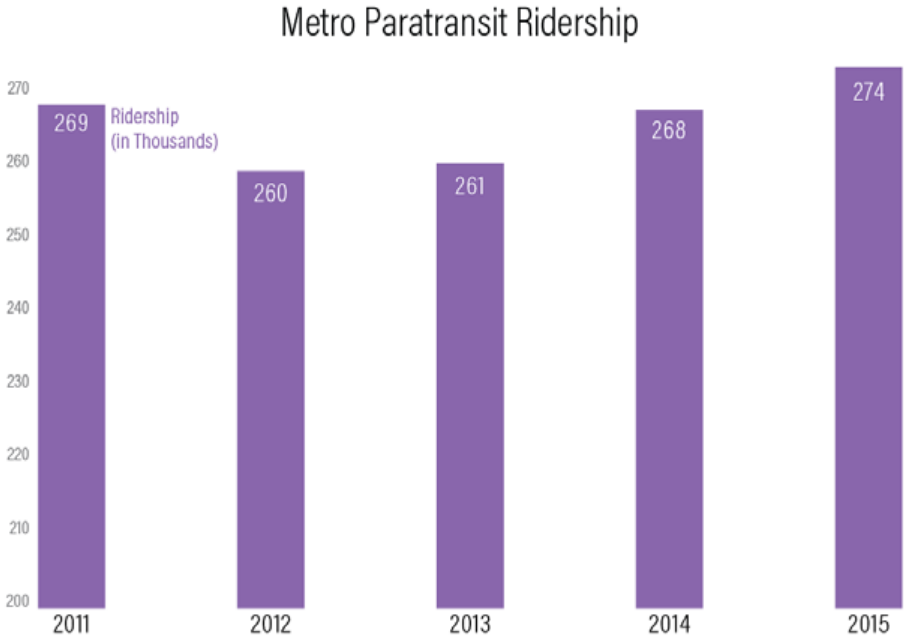
Metro Transit, serving Madison as well as neighboring partner communities including Middleton, Fitchburg, Verona, has seen increasing fixed-route ridership nearly every year since 1990; however, ridership dropped almost 6% in 2015 despite a similar level of service. Although the causes of this drop in ridership are not completely understood, a number of factors may be contributing. Ridership related to the UW and the Madison Metropolitan School District seem to be affected more than the system overall – possibly resulting from changes in students' residences and mild winters. A 30% drop in gas prices and strong economy have led to an increase in vehicle miles traveled which may in turn be contributing to lower ridership. The downward trend in overall ridership has only been observed for a little over a year, but is large enough to be a concern.

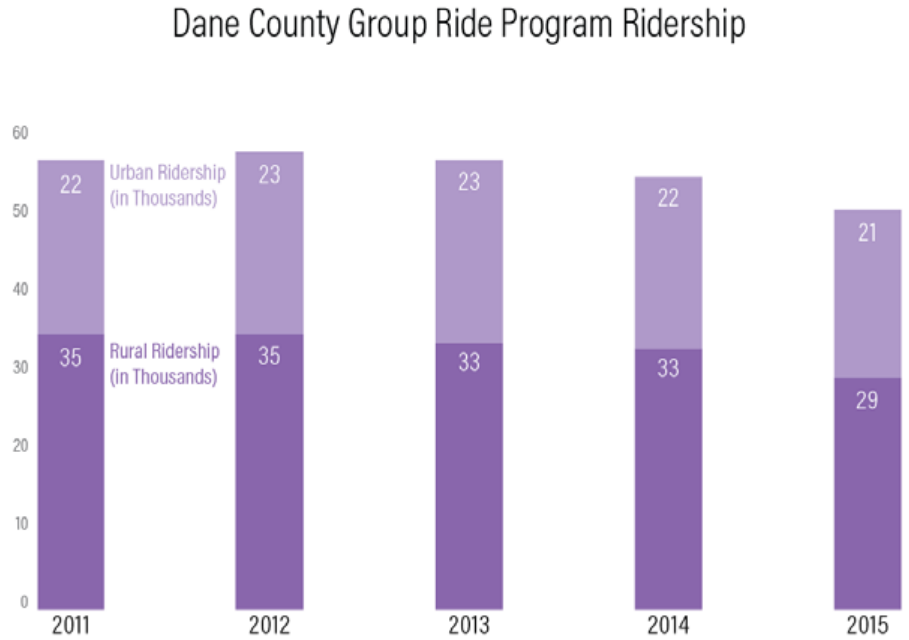






Source: MATPB - 2015 Roadway Centerlines, Metro Transit - 2015 routes, stop locations/ridership





Specialized Transportation Ridership

Transportation service targeting seniors and people with disabilities is provided by an array of different programs and partnerships between public agencies, non-profits, and private transportation operators. A one-call center operated by Dane County Department of Human Services helps users navigate the various programs.

Dane County's Group Access Service, which covers the cities of Madison, Middleton, and Monona, and its Rural Senior Group Transportation Program, which covers the rest of the county, provide regularly scheduled accessible group rides for seniors to destinations like congregate meal sites, community centers, and shopping. Use of the rural service has declined slightly in the last five years. Metro Transit's paratransit service provides the majority of door-to-door accessible service for people with disabilities in the Madison area, which saw a small ridership drop in 2012 that has recovered.



Fixed Route Transit Service Area

Fixed-route transit service provides transportation open to the public on set routes using reliable schedules with buses stopping to pick up and drop off passengers at signed bus stops. Riders use the service for many purposes but surveys show that routine trips like work and school commutes are much more likely to be made by transit. Service area coverage is an important metric because it shows the population that has access to this service.

The fixed-route transit service area is defined as a ¼-mile buffer from a bus stop, equivalent to about a five-minute walk. All-day service covers more than 55 square miles and roughly 65% of all residents living within the Madison Urban Area. Peak period-only routes extend coverage on weekday mornings and afternoons to 69 square miles and over 71% of residents. Peak period service is useful for traveling to first shift jobs, but does not provide all-day mobility to people for many other trips.

DESIRED TREND

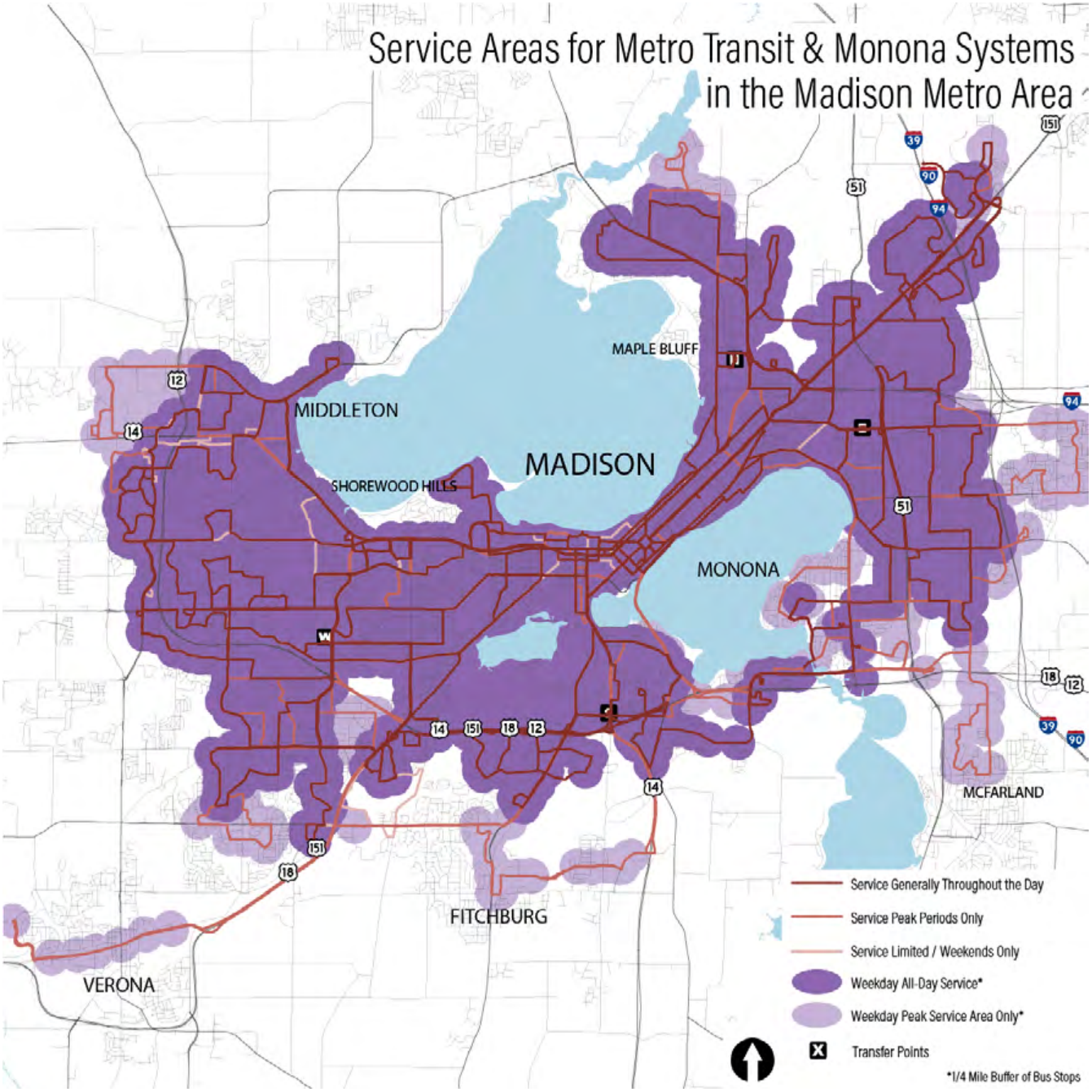


INCREASE
in coverage and
population served

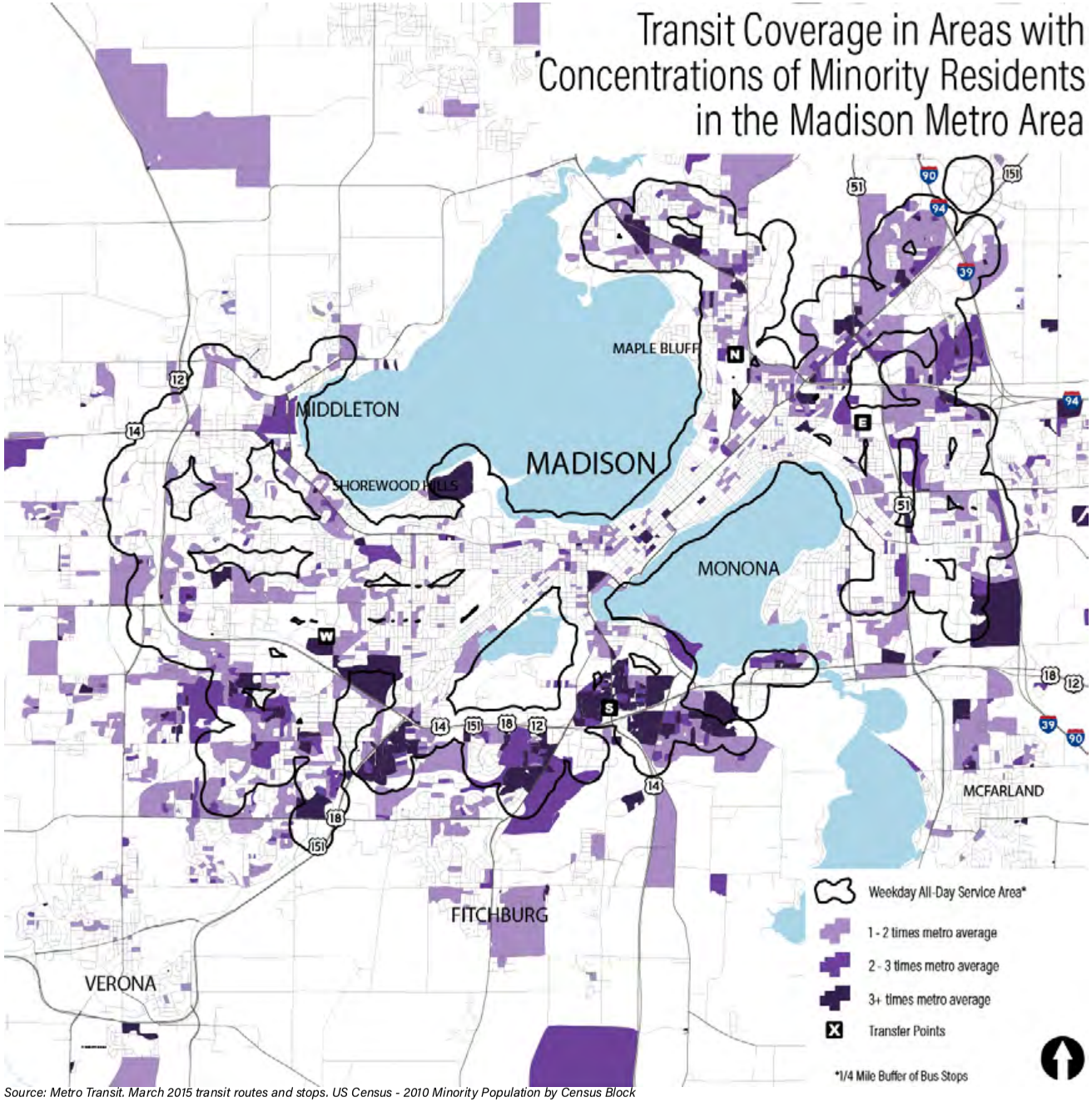
ACTUAL TREND



INCREASE
in coverage and
population served



Source: Metro Transit. March 2015 transit routes and stops.



Source: Metro Transit. March 2015 transit routes and stops. US Census - 2010 Minority Population by Census Block

Transit Coverage for Minorities and Low Income Persons

Transit accessibility is important for all people but especially for minorities and low-income families because they are more likely to rely on public transit than other segments of the general population.

The 2015 Metro Transit On-board Survey provides a glimpse into who uses the public transportation system in the region. The survey revealed that an estimated 27% of transit riders are minority individuals (Black/African American, Asian, and other/multiple races) and 37% of riders, excluding college/university students, indicated they have a household income below $35,000 per year. By comparison, the general population in the region is about 17% minority and the average regional household income is over $60,000.

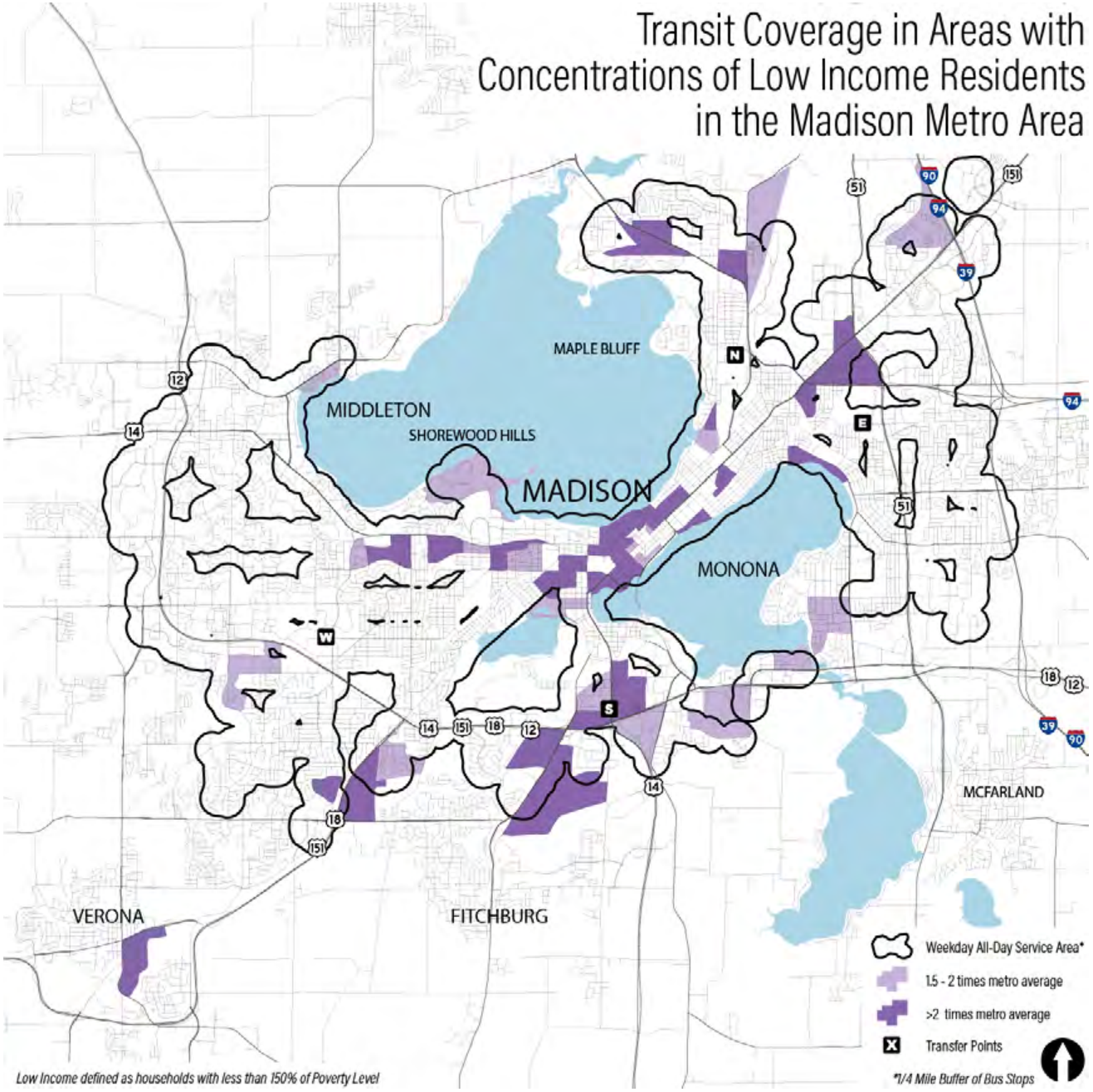
Overlaying the all-day fixed-route bus service area with census blocks with high concentrations of minority and low-income residents provides a visual representation of populations that have access to public transit. Overall, an estimated 78% of low-income residents and 58% of minority residents in the Madison Urban Area have access to all-day bus service.

DESIRED TREND

INCREASE
in coverage and population served

ACTUAL TREND

?
UNKNOWN



Source: Metro Transit. March 2015 transit routes and stops. CTPP - 2010 Poverty Level by TAZ

Related Links and Information:

- 2015 Madison Metro Transit On-board Passenger Survey
- 2013 - 2017 Transit Development Plan for the Madison Urban Area
- Title VI Non-Discrimination Program / Limited English Proficiency Plan
- Section 5310 Program Management and Recipient Coordination Plan
- Public Transit Trends in the Madison Area
- Metro Transit Paratransit Service Area Map
- Group Access Service Information



Reduce the Environmental Impact of the Transportation System

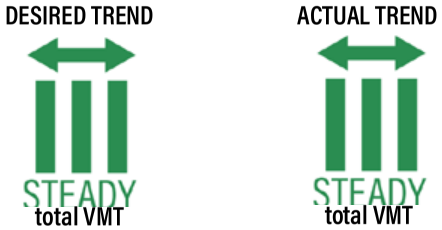
Ensure that the transportation system is designed, built, operated, and maintained in a way that protects and preserves the natural environment and historic and cultural resources, and is supportive of energy conservation.

Reduce the Environmental Impact of the Transportation System

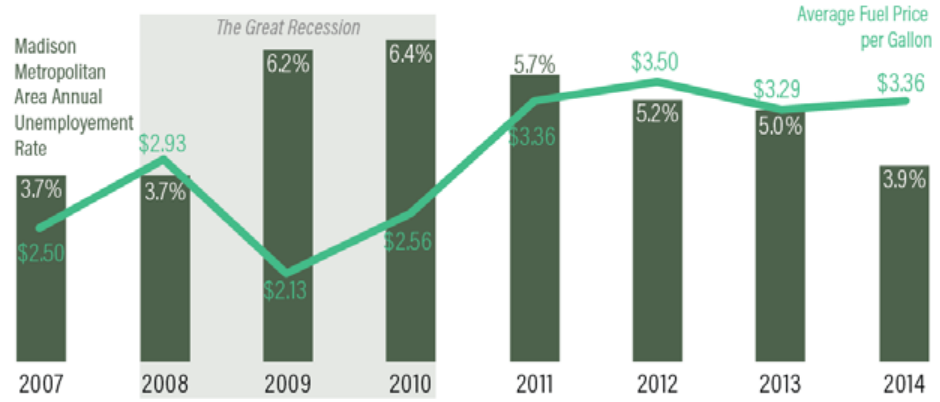
Vehicle Miles Traveled

Vehicle Miles Traveled (VMT) is a measure of all of the miles driven within an area within a specified time-frame. Lower VMT means that fewer pollutants are released into the atmosphere and that area residents are diverting trips to other, more environmentally friendly alternatives.

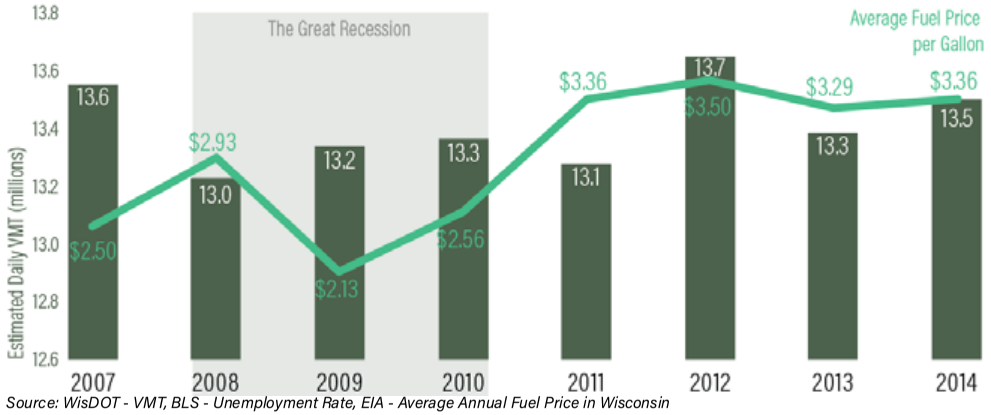
VMT peaked in 2005 at the peak of the housing boom and height of the 2000s economic growth. In late 2007 fuel-oil and heating-oil prices began to rise as the "housing bubble" burst. The result was the Great Recession in which local unemployment increased to over 6 percent while national unemployment increased to 10 percent at its height. Mid-recession, inflation-adjusted gas prices fell to pre-recession numbers. The region's relatively strong economy compared to the rest of the state coupled with relatively low fuel prices may account for the slight increase in VMT throughout the recession. In 2011, unemployment began to gradually decline while at the same time, fuel costs reached their highest levels in years. VMT contraction lagged behind the fuel price increases in 2011, but factored in VMT reductions in 2013 and 2014.



Madison Metro Area Unemployment Rate & Average Annual per Gallon Fuel Prices
(inflation adjusted to 2014)



Average Daily Vehicle Miles Traveled (VMT) and Average Annual per Gallon Fuel Prices
(inflation adjusted to 2014)

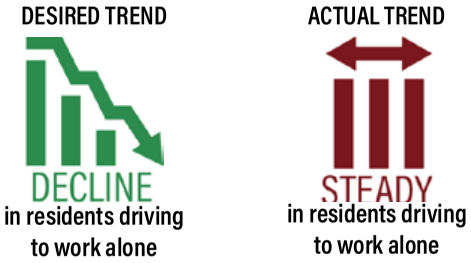


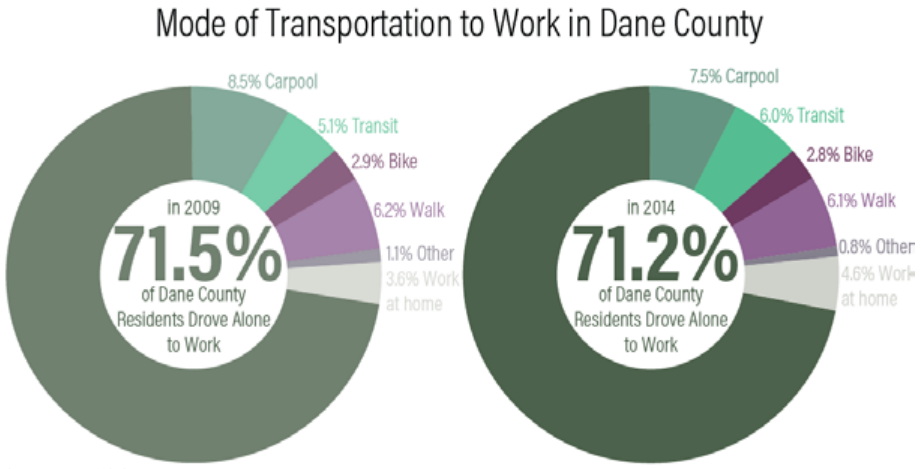
Source: WisDOT - VMT, BLS - Unemployment Rate, EIA - Average Annual Fuel Price in Wisconsin

Mode of Transportation to Work

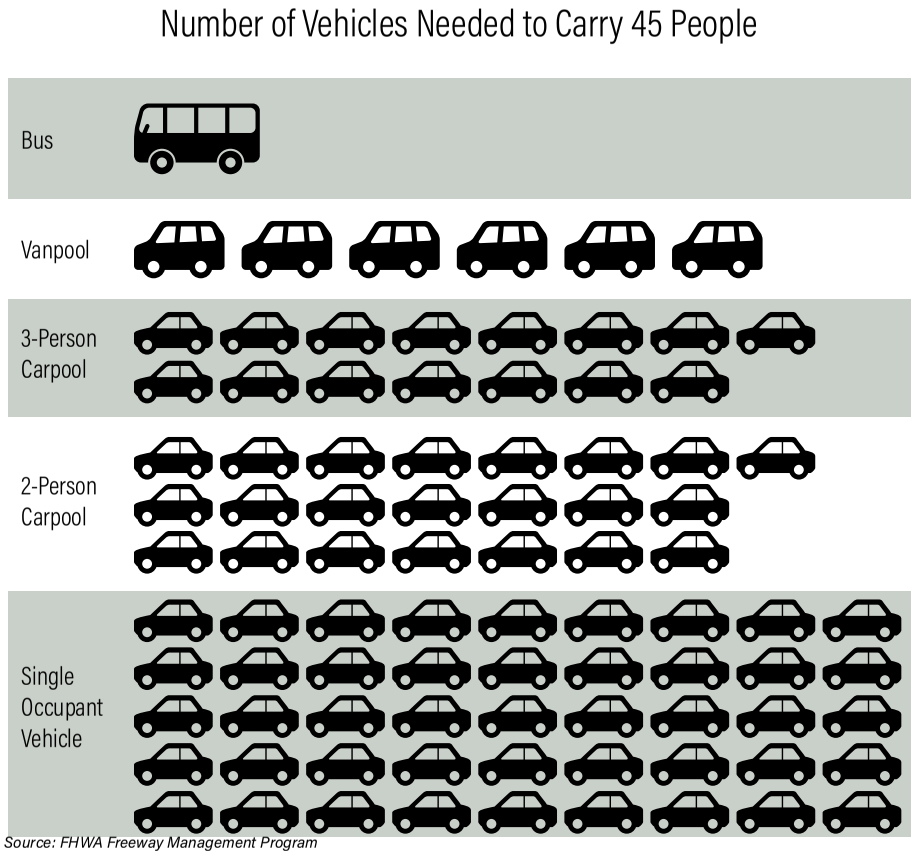
Commuting to work is one of the most predictable and common trips made by adults. About 70 percent of people aged 16 and older are part of the workforce population - roughly 46 percent of total population. Work trips most often occur during congested time periods and are the largest contributor to travel time delay. They are also slightly longer than trips for other purposes and anchor travel for other purposes. In all, commuting represents more than 28 percent of all miles of personal travel.[2]

In Dane County, over two-thirds of all resident commuting occurs by driving to work as a single occupant in a vehicle (SOV) – something that has remained relatively consistent over time. There have been changes in the mode-split of non-SOV trips, including a decrease in carpooling, increase in transit ridership, and an increase in the number of people working from home.





Source: 2010 US Census



Source: FHWA Freeway Management Program

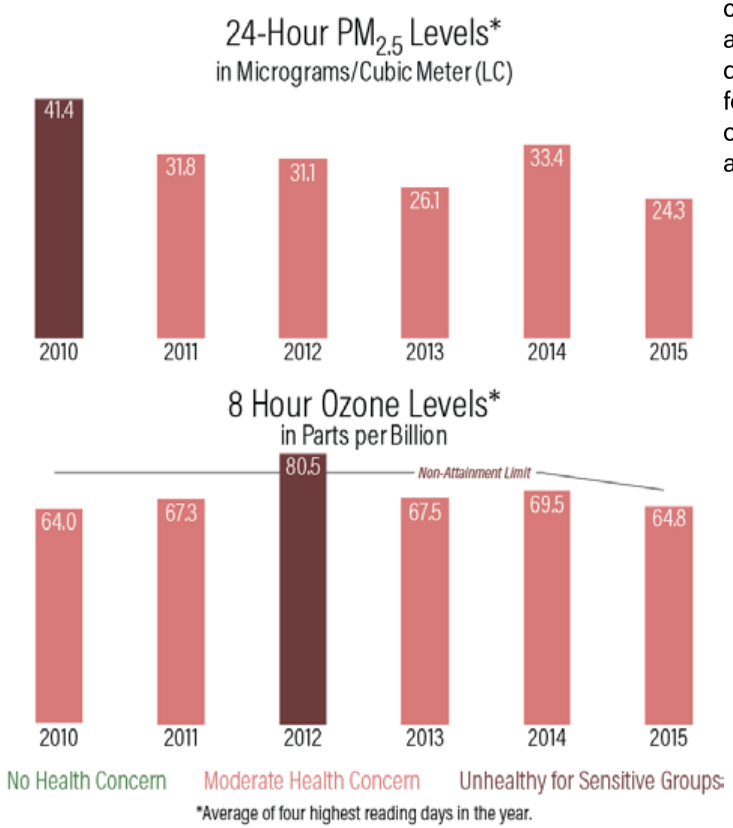
2. Commuting in America 2013: The national report on commuting patterns and trends. (2013). Washington, DC: American Association of State Highway and Transportation Officials.

Air Quality

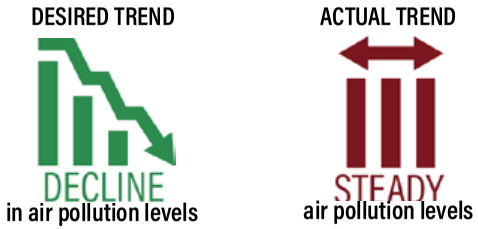
Examining the air quality of a region is one of the best ways of measuring the impact of the transportation system on the environment. Emissions from transportation account for 26% of total U.S. greenhouse gas emissions – second only to the electricity sector. The Clean Air Act provides standards for a variety of pollutants including ozone, particulate matter (PM 2.5), carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. Each of these air pollutants can be linked to specific adverse environmental impacts. PM 2.5 is a component of acid rain, which changes the nutrient balance of lakes and streams. It also damages culturally important monuments, statues, and buildings by staining and damaging stone.

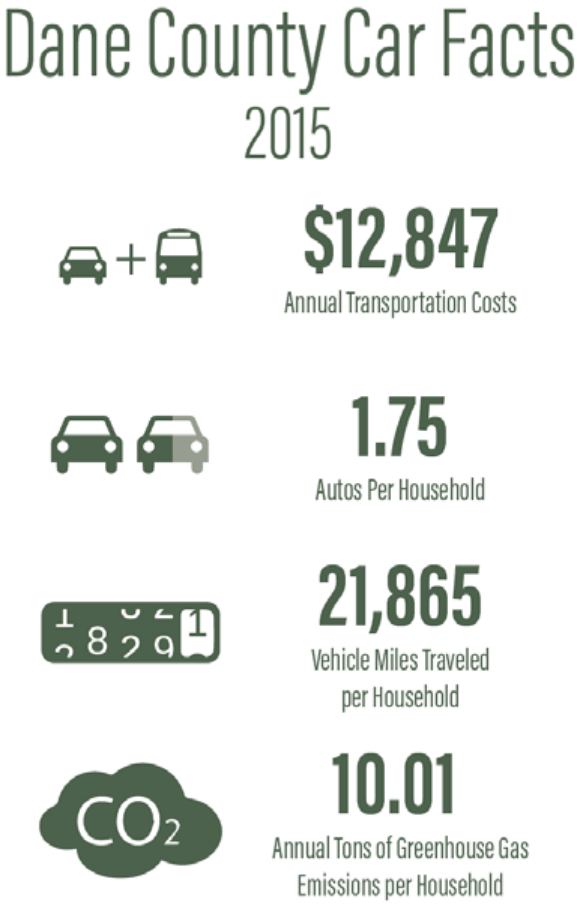
Monitoring air quality is important not only for the environment, but also for the health of everyone in the region. Particle pollution can be absorbed into the body through the lungs and has been linked to a variety of serious health conditions or illnesses such as coughing/difficulty breathing, decreased lung function, asthma, irregular heartbeat, nonfatal heart attacks, and premature death in people with heart or lung disease.

In the Madison region, PM 2.5 and ozone are measured daily from the University of Wisconsin - Madison campus. Over the last six years, PM 2.5 levels have steadily declined. The region's current PM 2.5 levels pose no significant health risk. The region's ozone levels, however, are not trending down. Ozone levels have remained relatively consistent, posing a moderate health concern for area residents. In 2012, levels on some summer days were high enough to be considered "unhealthy for sensitive groups," such as people with asthma, older adults, child, teenagers, and people who are active outdoors.

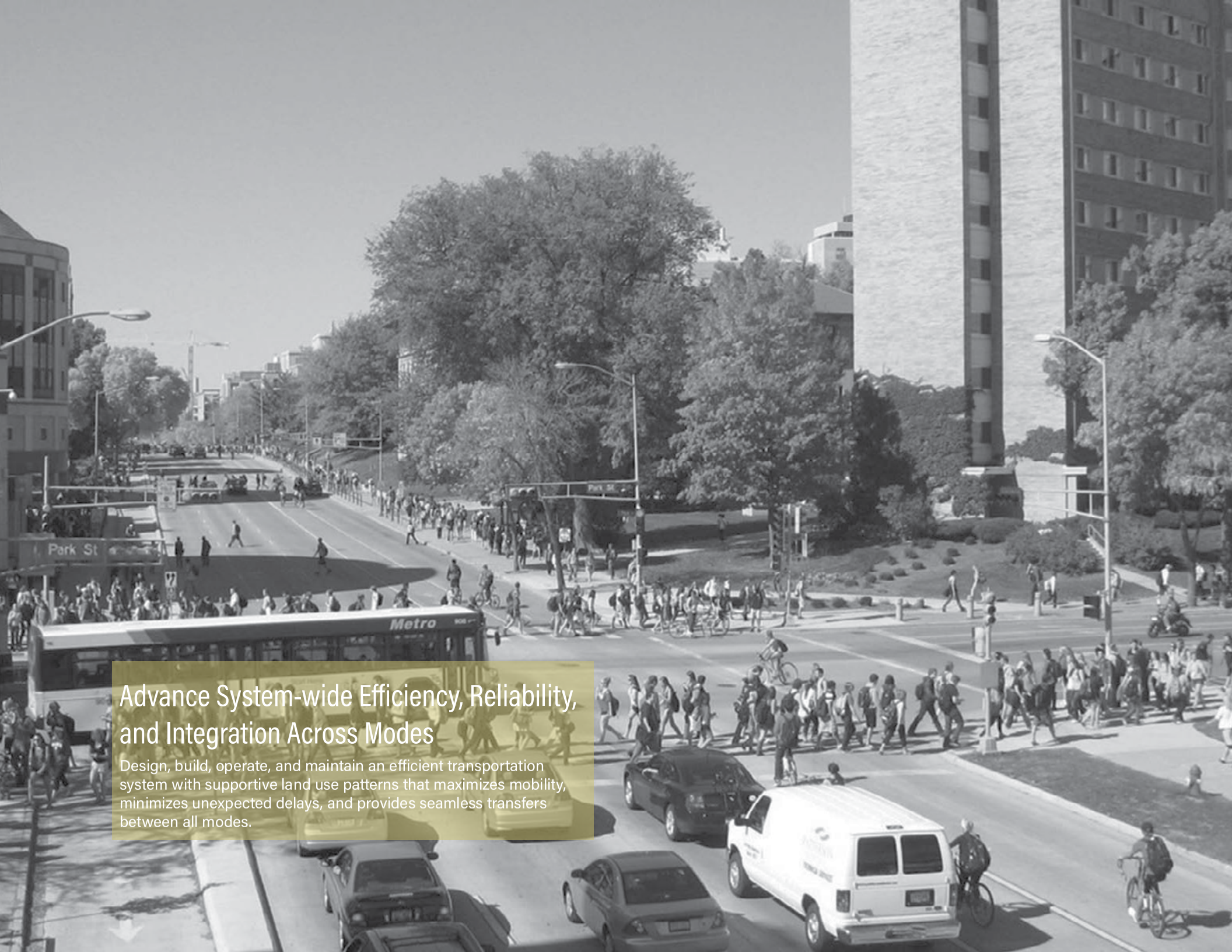


Source: US EPA





Source: CNT - Dane County Fact sheet, 2015



Advance System-wide Efficiency, Reliability, and Integration Across Modes

Design, build, operate, and maintain an efficient transportation system with supportive land use patterns that maximizes mobility, minimizes unexpected delays, and provides seamless transfers between all modes.

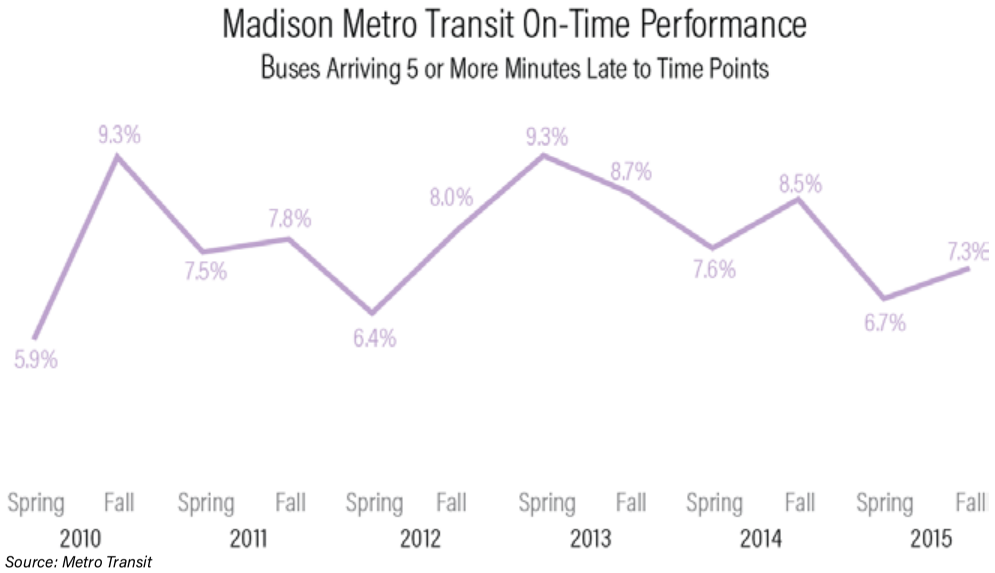
Transit On-time Performance

Reliability is crucial for a transit system. People using transit are more likely to be traveling to work and unreliable transportation options can result in people arriving late to work through no fault of their own. Further, many trips require transfers between buses – missed transfers can strand riders for up to an hour. When these things happen, riders are likely to stop using transit.

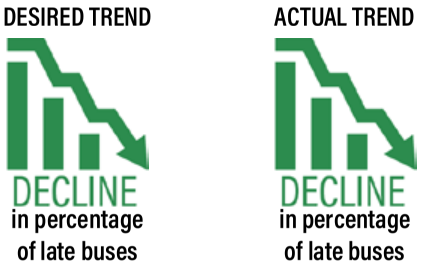
Lateness for this analysis is defined as a bus that arrives at a time point five or more minutes late. The time periods are each spring and fall semester between the first and last days of class, weekdays only, excluding Thanksgiving and Spring Breaks.

Metro Transit's on-time performance has fluctuated between about 6% and 10% for the past five years with performance improving overall since 2013. The on-time performance numbers represent high reliability for an urban transit system. However, Metro's timed transfer ("pulse") system requires a very high level of on-time performance and routes and schedules have been created and adjusted to achieve this – in some cases sacrificing travel time in favor of reliability.

On-time performance is the worst during the afternoon peak periods when traffic congestion is worse. Some routes perform better than others. In many cases, late buses are the result of traffic congestion caused by accidents and road construction as well as other events that are beyond Metro's control.



Source: Metro Transit



Percent of Key Destinations Served by Transit

To provide utility to riders, transit must serve the places that people want to go. Key destinations include jobs, medical facilities, and grocery/retail stores. With the exception of some jobs, it is important that these destinations are accessible not only during morning and afternoon peak periods, but also throughout the day and on weekends.

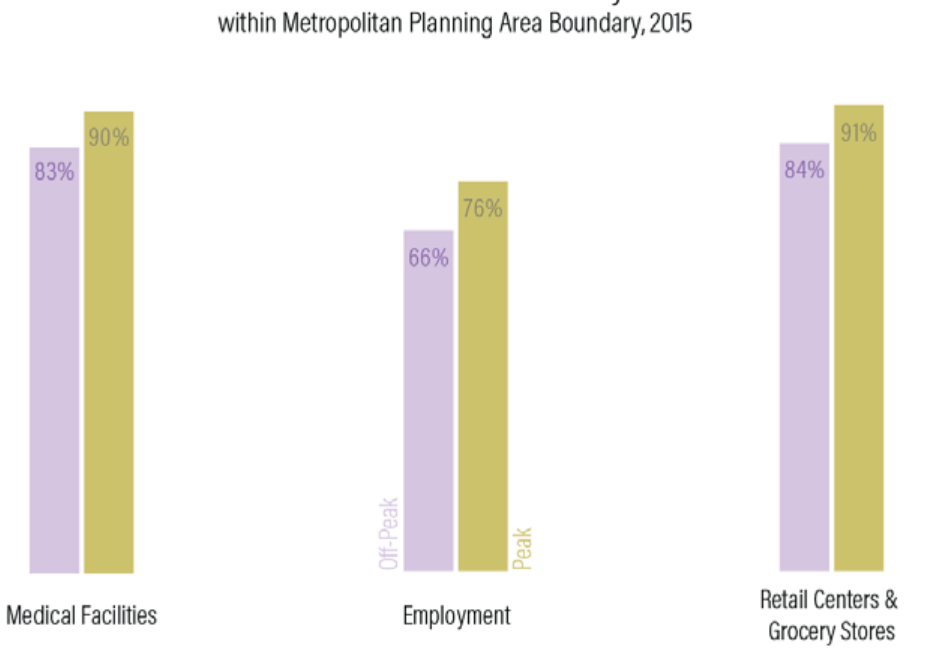
Medical and retail centers are more concentrated in the City of Madison and have a higher level of transit accessibility than jobs. 2015 is the first year this measure was collected and will serve as a baseline year.

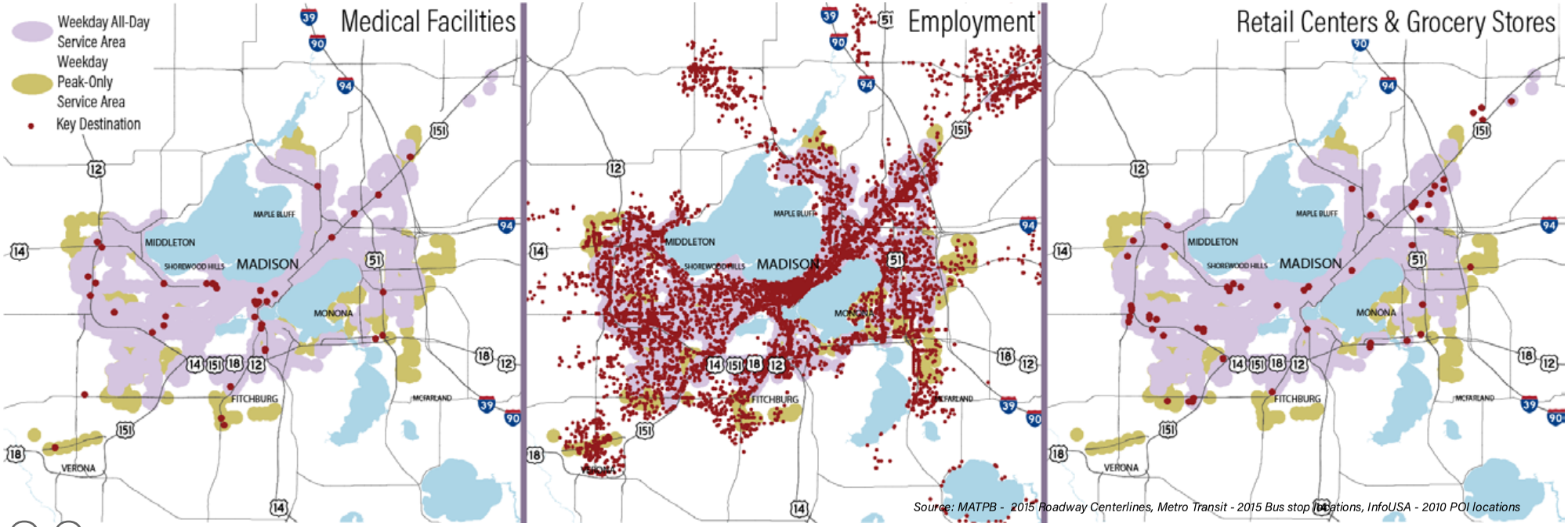
DESIRED TREND

INCREASE
in number of destinations covered

ACTUAL TREND

?
UNKNOWN





Roadway Congestion and Reliability

Roadway congestion is common during the morning and afternoon rush hour periods on heavily traveled regional roadways. Related to congestion is travel time reliability - the variability in travel times that can occur from one day to the next. For most commuters, congestion is understood, anticipated, and planned for.

Drivers generally budget extra time to allow for routine delays, whereas unanticipated variability or delays can be a source of frustration as it can make commuters late for work, cause buses to run late, make business travelers late for appointments or meetings, cause truckers to be charged for late deliveries, and can disrupt the just-in-time delivery process. In many cases, rush hour congestion is difficult or impossible to solve due to physical constraints, costs, and the negative impacts of roadway expansion; however, reliability can be improved through a variety of operational enhancements or incident response management techniques.

There are seven commonly accepted sources of congestion that can lead to travel time reliability issues:

1. Physical Bottlenecks (40%) – Capacity limitations due to design of motorway
2. Traffic Incidents (25%) – Crashes and accidents that impeding travel lanes
3. Work Zones (10%) – Construction activities that result in physical changes to motorway
4. Weather (15%) - Snow, rain, or other events that change driver behavior and impact flow
5. Traffic Control Devices (5%) – Poorly timed signals, rail crossings, etc.
6. Special Events (5%)– Sporting events, concerts, etc. that cause surges in traffic demand
7. Fluctuations in Normal Traffic – Day-to-day variations that lead to high-demand days

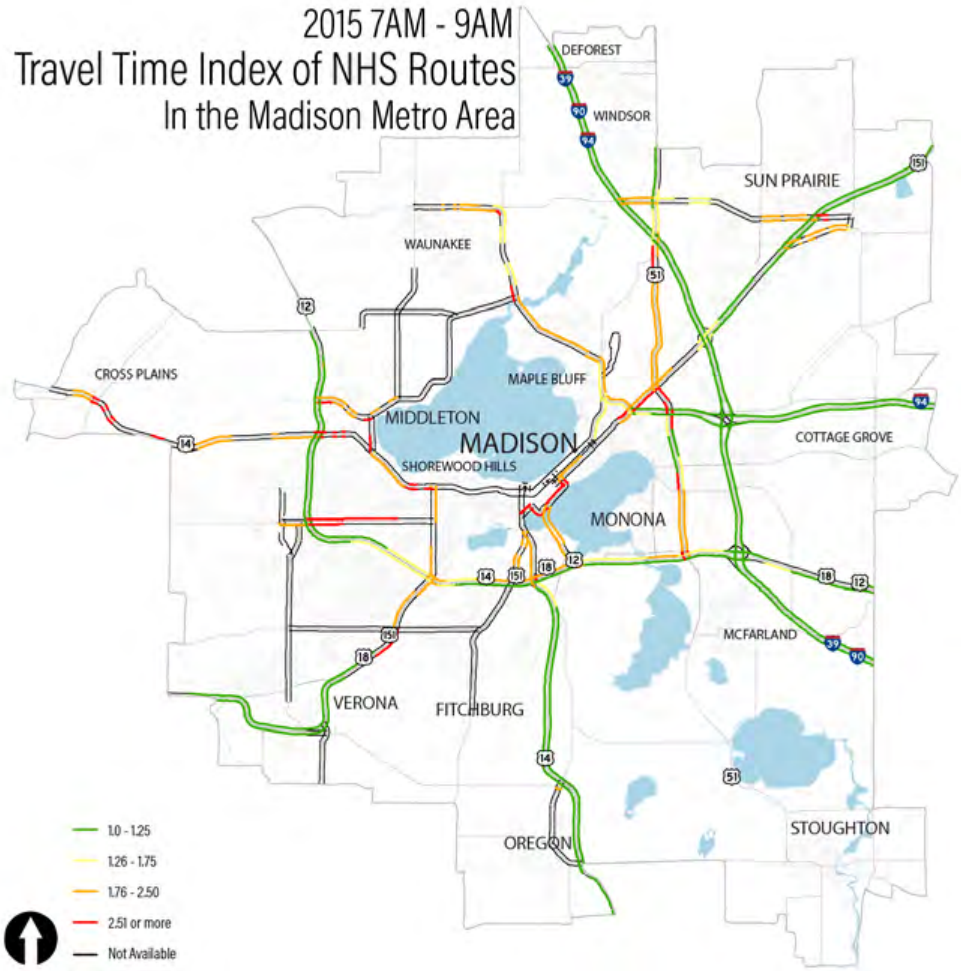
Complicating things, many of these sources of congestion can trigger another source to occur (weather event causing crash, special event making work zone bottleneck worse, etc.). This means that significant payoffs can be expected by implementing a comprehensive congestion management process that includes

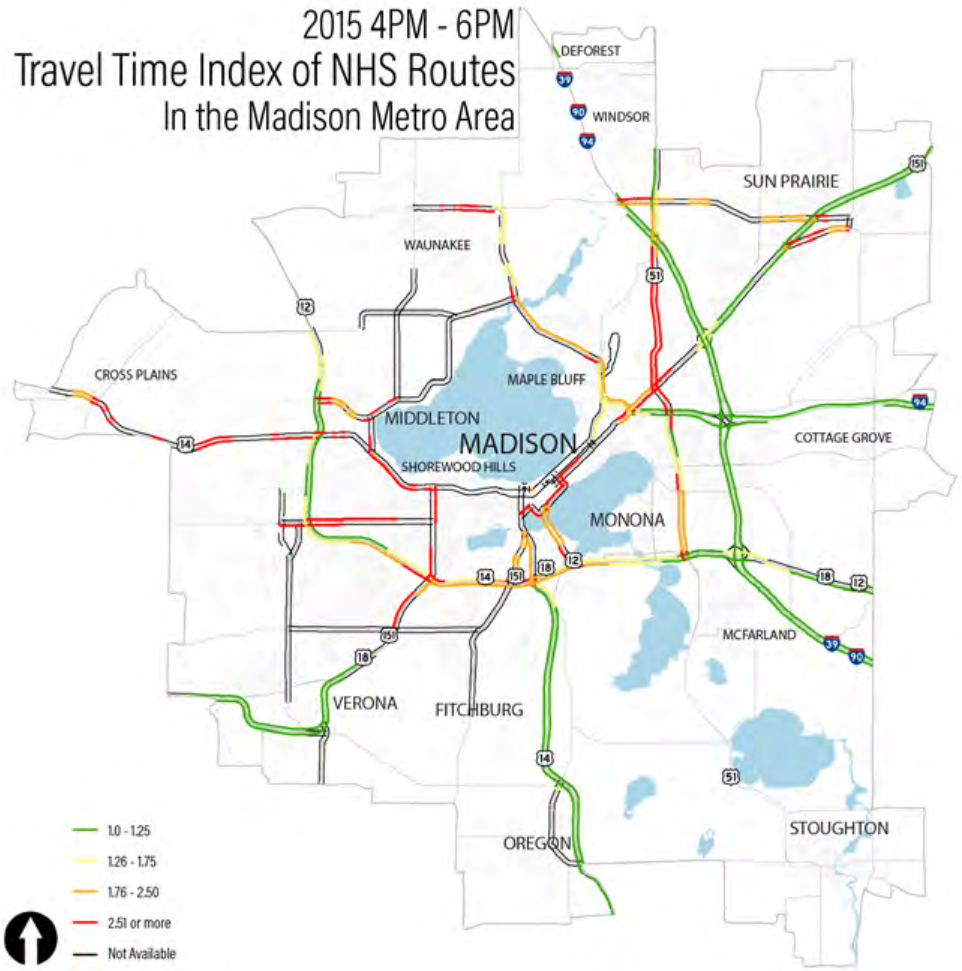


Source: Madison.com



Source: Madison.com





transportation demand and system management and operations strategies such as transit and ride-sharing incentives, traffic signal coordination, traveler information, and enhanced incident response, along with physical bottleneck relief through targeted capacity expansion where feasible.

The most accepted measure of congestion is Travel Time Index (TTI), while the most widely accepted measure of reliability is Planning Time Index (PTI).

Travel Time Index is defined as the average time it takes to travel on a roadway during the peak period relative to the time when no congestion is present. This means that if a commute along a corridor would take 15 minutes without congestion and it has a TTI of 1.60 at 4pm, the trip will take 24 minutes at that particular time. The most congested roads in the area include John Nolen Drive, Verona Road, and Stoughton Road. Overall, system-wide TTI during the morning rush hour is 1.49, while the evening rush hour is 1.60

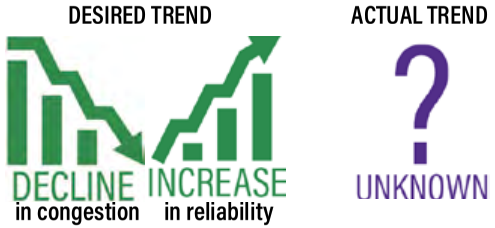
Planning Time Index is defined as a measure of time that should be planned for when an adequate buffer is included in a trip to ensure on-time arrival 95% of the time. This means that if a driver were to have a 15 minute trip on a corridor with a PTI of 1.60, they should plan allot 24 minutes for their commute to make ensure they are on time 19/20 times (15 minutes x 1.60 = 24 minutes). The above maps show PTI for the Madison Metro Area. The interstate highways experience the least





variable conditions while the Beltline, Stoughton Road, and John Nolen Drive are among those that are highly variable. Overall, system-wide PTI during the morning rush hour is 2.63, while the evening rush hour is 3.12.

2015 will serve as a baseline year for both TTI and PTI.





Establish Financial Viability of the Transportation System

Achieve and maintain a state of good repair for the existing transportation system, invest in cost-effective projects, and ensure adequate, reliable funding to meet current and future needs.

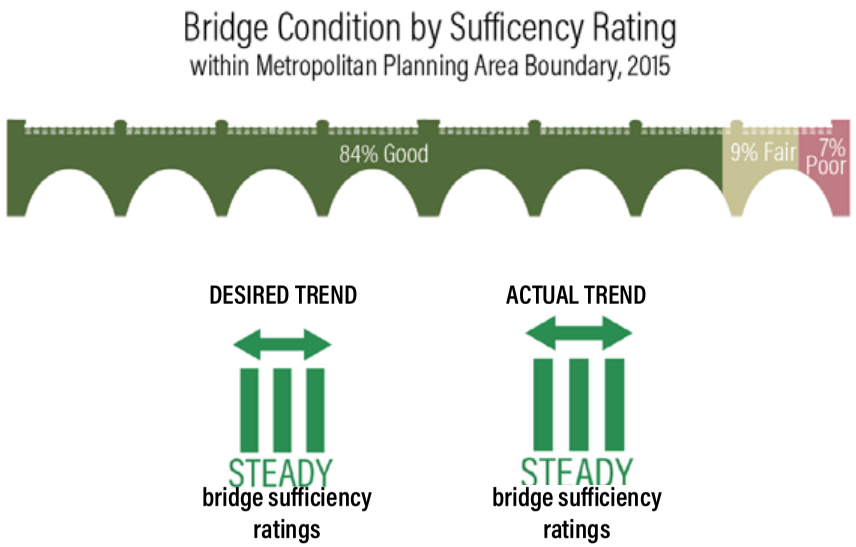
Establish Financial Viability of the Transportation System

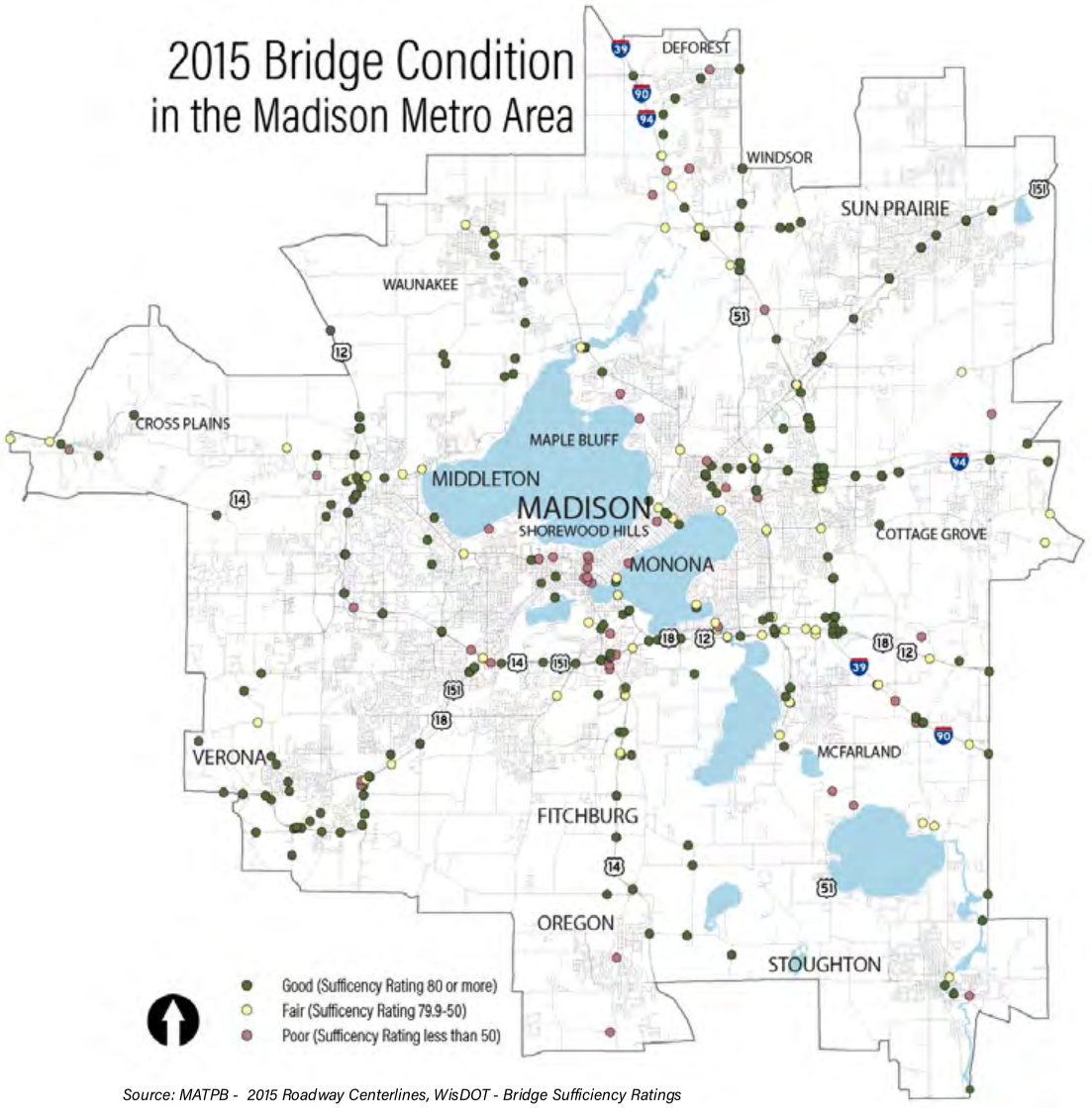
Bridge Condition

Bridge sufficiency is a method for expressing the condition of a bridge developed by FHWA and stored in the National Bridge Inventory. Approximately 55% of the sufficiency rating is based on a structural evaluation of the bridge, 30% from the obsolescence of its design, and 15% essentiality of the bridge to the public.

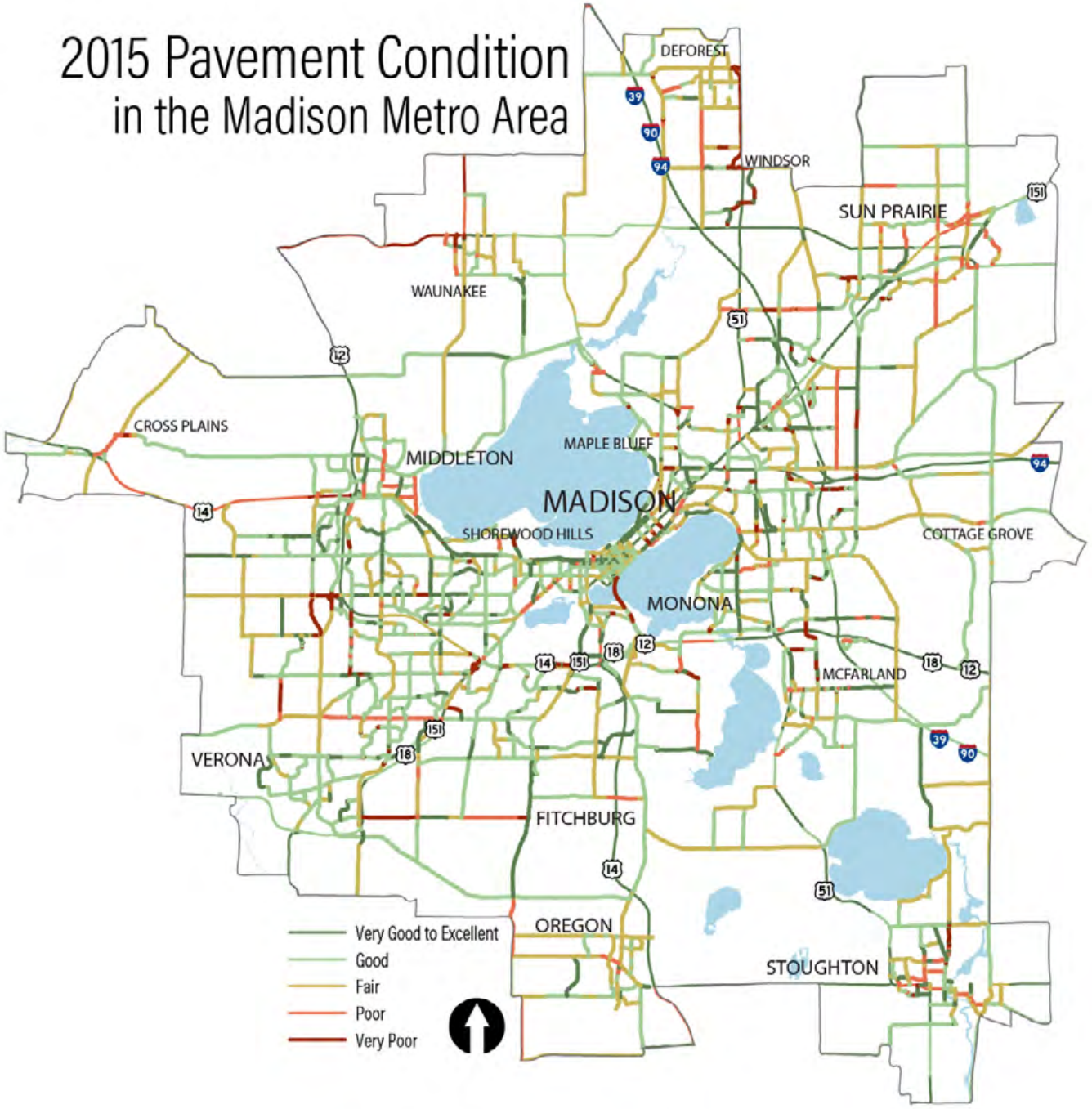
A bridge's sufficiency rating is important not only for safety, but also for funding. A sufficiency rating of 80 or less qualifies a bridge for federal repair funding, while a score of 50 or less qualified a bridge for federal replacement funding. Federally funded bridge projects still require a 20% local funding match.

In the Madison area, more than 90 percent of all bridges are in good (80+) to fair (50-79.9) condition. In fact, 84% of all bridges are in good condition. This maintains a regional trend that has held for more than 5 years. A total of 9 bridges with a poor sufficiency rating are programmed for replacement in the next five years, while 10 bridges with a fair rating are programmed for rehabilitation work.





Source: MATPB - 2015 Roadway Centerlines, WisDOT - Bridge Sufficiency Ratings

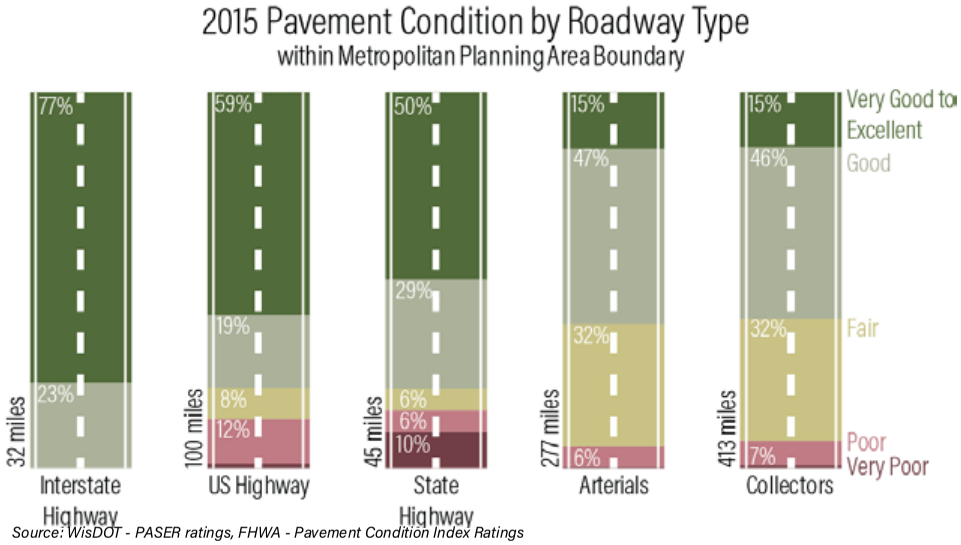


Source: MATPB - 2015 Roadway Centerlines, WisDOT - PASER ratings, FHWA - Pavement Condition Index Ratings

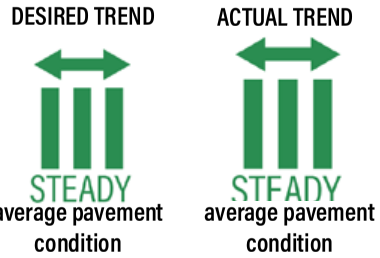
Roadway Pavement Condition

Timing road maintenance projects appropriately extends the useful life of the roadway and saves money over the life of the pavement. Extreme pavement degradation can be minimized by performing preservation treatments early in the life-cycle of a roadway.

Roadways with a "fair" Pavement Condition Index (PCI) score are generally nearing the end of their repairable life. Lower volume roads routinely fall into this category, while high-volume, regional mobility corridors rarely do. In the Madison area, 65% of all roads are in good or excellent condition, 27% are fair, and 8% are poor or very poor. All of the Interstate highways in the area have a PCI of at least "good."



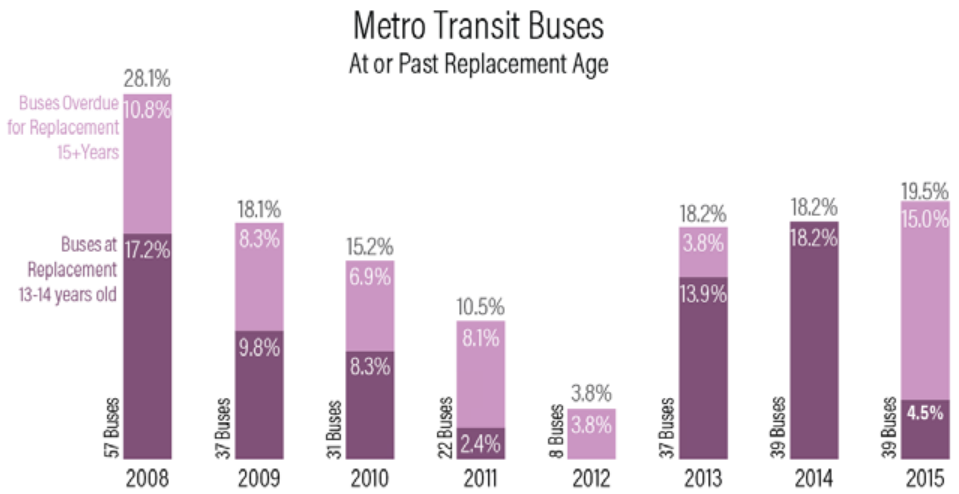
Source: WisDOT - PASER ratings, FHWA - Pavement Condition Index Ratings



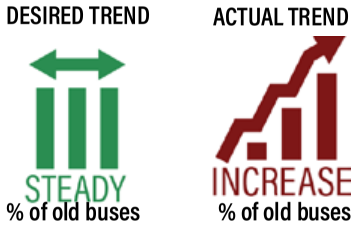
Buses At or Past Replacement Age

Like any vehicle, buses cost more to operate and repair near the end of their life; however, replacing buses is expensive and not always possible due to funding constraints. Also, Metro uses its oldest buses for supplemental school service, other peak only service, and as backups for buses in service. These buses log far fewer miles per day. Thus, it makes financial sense to maintain some older buses in its fleet for such limited service.

Between 2008 and 2012, the number of buses at (13-14 years) or past replacement (15+ years) age precipitously declined year-after-year due to a more aggressive replacement schedule and an unexpected influx of Federal American Recovery and Reinvestment Act (ARRA) funding. Due to a sharp decline in Federal funding available to Metro with a change in Federal transit programs, the percentage of the fleet at or near replacement has reached 2009 levels once again.



Source: Metro Transit



Performance Measures Overview

Measure	Desired Trend	Actual Trend	Analysis
Miles of Pedestrian Facilities	Increase in miles of facilities	Increase in miles of facilities	26 miles of pedestrian facilities were completed in 2015.
Miles of Bicycle Facilities	Increase in miles of facilities	Unknown	This is the first year comprehensive data has been collected using this methodology.
BCycle Utilization	Increase in utilization	Increase in utilization	BCycle miles biked increased by nearly 1/3 and trip lengths increase by 44%.
Active Living Index Score	Increase in community scores	Unknown	This is the first year comprehensive data has been collected using this methodology.
Injuries and Fatalities	Decline in injuries and fatalities	Decline in injuries and fatalities	Using five-year rolling averages, motorized and non-motorized fatalities and serious injuries have declined nearly every year.
Airline Passenger Traffic	Increase in passengers	Increase in passengers	Passenger volume has been increasing, rising nearly 9% since 2010.
Freight Exports and Imports	Increase in total freight tonnage	Increase in total freight tonnage	Inbound and outbound freight volumes have increased and shifted to on-road options.
Housing + Transportation Costs	Steady Housing + Transportation Costs	Steady Housing + Transportation Costs	Combined housing and transportation costs have increased due to a sharp rise in the costs of housing metro-wide.
Transit Access to Jobs	Increase in job accessibility percentages	Unknown	This is the first year comprehensive data has been collected using this methodology.
Transit Ridership	Increase in ridership	Decline in ridership	A 30% drop in gas prices, strong economy, and mild winter may have contributed to the drop in ridership.
Specialized Transit Ridership	Steady ridership	Steady ridership	Metro Paratransit ridership has returned to 2011 levels, while Dane County Group Ride Program ridership has leveled off.
Fixed Route Transit Service	Increase in coverage and population served	Increase in coverage and population served	Metro Transit continues to add routes that increase peak and all-day coverage and population served.
Transit Service for Minorities and Low Income Persons	Increase in coverage and population served	Unknown	This is the first year comprehensive data has been collected using this methodology.
Vehicle Miles Traveled	Steady total VMT	Steady total VMT	VMT data is only available through 2014, meaning gas price drops are not accounted for with this dataset. 2015 may see sharp increased in VMT.
Mode of Transportation to Work	Decline in # of residents driving to work alone	Steady # of residents driving to work alone	A little more than 71% of work-related trips are single occupant vehicles and have been for the past five years.
Air Quality	Decline in air pollution levels	Steady air pollution levels	Air pollution levels are tied to SOV utilization and VMT - both of which have remained steady over the last five years.
Transit On-time Performance	Decline in percentage of late buses	Decline in percentage of late buses	A transfer point-based system relies on strong on-time performance. The system will continue to perform well as routine route modifications take place.
Percent of Key Destinations Served by Transit	Increase in number of destinations covered	Unknown	This is the first year comprehensive data has been collected using this methodology.
Roadway Congestion	Decline in congestion	Unknown	This is the first year comprehensive data has been collected using this methodology.
Roadway Reliability	increase in reliability	Unknown	This is the first year comprehensive data has been collected using this methodology.
Bridge Condition	Steady bridge sufficiency ratings	Steady bridge sufficiency ratings	Federal, State, Regional, and Local agencies have demonstrated a strong commitment to maintaining bridge condition. More than 90% are "good."
Roadway Pavement Condition	Steady average pavement condition	Steady average pavement condition	65% of all roads are in "good" or "excellent condition and all Interstate highways in the area have a PCI of at least "good."
Buses at or Past Replacement Age	Steady percentage of old buses	Increase in percentage of old buses	The end of ARRA funding has meant the return of fleet age to pre-2008 levels.